The Builder.

VOL. XXXVII. No. 1901. SATURDAY, APRIL 26, 1879.

ILLUSTRATIONS.

A Christian "Acropolis": Erfurt, Germany 456, 457

CONTENTS.

"The Home of Sennacherib" 443
Art in the School and Art in the Home 448
The True Scale for Miners' Wages 447
A Ministry of Health 448
Improvements in Glasgow and the City Improvement Acts: Origin of the Artisans' Dwellings Act 449
Institute of Painters in Water-colours 450
The Recent Excavations at the Colosseum 451
Ancient Locks and Keys 452
A Celebrated Printing-office 453
Assyrian Statistics 453
Lyme Regis 454
A Christian "Acropolis": Erfurt, Germany 454
Royal Institute of British Architects: Operation of the Artisans' Dwellings Act 459
Wages and Strikes 461
New Buildings in St. Mary Axe 462
Stone v. Terra Cotta 462
The Belgian Jubilee Hall 463
Completion of the New Highgate Infirmary 463
Art and its Motive 463
Chiselborough cum-Chinnock 463
St. Paul's Cathedral 463
Teddington Cemetery 463
Tramways: Society of Engineers 464
Factory and Workshop Inspection 464
All Hallows' Temporary Church, Southwark 464
Parliamentary Jottings 464
Sewage Irrigation 465
Drainage and Sewerage Works 465
The New Bunhill Burial-ground, Islington 465
Uninhabitable Houses in Holborn 465
The British Archæological Association 466
Fire Brigades at Home and Abroad 466
Sanitary Shortcomings 466
Masters and Men 466
New Railway Stations 466
Theatres 467
Market Buildings 467
Halls 467
Water Supply 467
The Largest Stone in England 467
Kenilworth Sewerage Competition 467
Weymouth Drainage 467
Church-Building News 468
School-Building News 468
Variorum 468
Miscellanea 468

"The Home of Sennacherib."

THE traveller who has wandered from the tourist-trodden paths of the East, and resolved to pass the rubicon of the Euphrates, leaving behind him the guide-and-dragoman-haunted shrines of Syria, may truly be said to have entered into wonder-land. On the west bank of the Euphrates, with the last sight of the ruins of Mabug, the traveller leaves behind him all the old associations of ruined cities. No longer will lines of graceful columns and ranges of serrated battlements, richly clothed in their ruination with creepers and fringed with the crimson-blossomed oleander, stimulate his imagination to day-dreams of restoration. Nevertheless, right and left of him, as he wanders across the fertile plain of Upper Mesopotamia, he will see around him the graves of buried cities,—cities which, thirty centuries ago, were rich in flocks and herds, and whose kings were vassals of the courts of Assyria. On either bank of the swift Tigris, as his raft is whirled round and round by the eddies and rapids of that stream, he will see rising from the plain the dome-shaped mound and circling rampart of sandy soil which mark the ruins of some ancient town or city. When at last his swift-borne raft is stayed by the boat-bridge which crosses the stream opposite the busy town of Mosul, the traveller will see spread out before him in all their grandeur the ruins of ancient Nineveh:—

> "That circle o'er whose desert ring
> Those shapeless mounds their darkening shadows fling,
> That desolation—far as eye can see
> Forlorn and lifeless—once was Nineveh."

Yes, there as he stands on the flat roofs of the houses of the busy Moslem city, with all its hum and turmoil of bazaar and street, he can see spread out before him, in weird desolation, all that remains to tell of ancient Nineveh. And yet, in the mind's eye, how plainly, even in its dark and shapeless mounds, can he trace the plan of that great city. Here, along its western line of ramparts, once laved in the flood of the sacred Trigris, but now deserted by the fickle stream, he can see rising, abrupt but grandly, the mounds which mark the sepulchres of the halls of Nimrod. The northern and largest, oval in shape and pointed inwards, towards the city, marks the site of the great acropolis of Nineveh,—a lofty terraced mound, once crowned by the stately palaces and temples of the sons of Sargon. Here was the home of Sennacherib, the lion-hearted king, which, on the south-eastern end of the mound, cast the shadow of its terraces and colonnades in the clear stream of the Tigris. At the north-eastern extremity, forming, as it were, a northern wing, rose the still more rich palace of the heroic warrior-king, Sardanapalas, now to be recognised in the warlike grandson of Sennacherib, the great Assur-bani-pal (B.C. 668).

Too long has this warrior been the toy of poets and tool of fiction-workers. His history, as writ in the hard stones of his palace, and on the imperishable clay, prove him to have been no effeminate flower-clad monarch. Hardy and fearless in his wars against Egypt, Babylon, and the rude mountaineers of Elam, he may, in the hours of his well-earned peace, have lapsed into the dream of luxury-lulled repose; but the records of law and justice, of state decree, and royal call to arms, which he has left us in the annals of his palace, show that there was needed no Salimenes to call him from the arms of Grecian slave to rule his people right. Rebellion met with its stern antidote in the iron bands of warriors, headed by no intriguing deputy, but led on to victory by himself, their lord and king. Such was the monarch whose palace has furnished the rich treasures which now decorate the British Museum, and it was that palace which in all its majesty crowned the summit of the Koyunjik mound. On the north may be seen the line of ramparts which are broken here and there by irregular projections, which mark where once had been the watch-towers overlooking the fertile plain. One large opening in this chain of mounds, flanked by small eminences rising above the line of ramparts, indicates the site occupied by the great city gate, the "Arc de Triomphe" of Nineveh.

The *enceinte* of Nineveh is divided into two portions by the stream of the Khosr-su, which flows through the enclosure, washing all the south-east side of the Koyunjik mound.

In the southern portion of the city the line of the western wall is broken by the smaller mound called the Nebby Yunus or Tomb of Jonah, which marks the sites of palaces and temples erected by Sennacherib and his successors. Toward the east, in regular lines, the traveller will see the ruins of the strong, fortified walls and ramparts, ditches and outpost towers, which formed the strength of Nineveh, fitly styled by her chroniclers the "Supreme Fortress," "The Mighty City beloved by Istar, Queen of Battles." The rich carved columns and shady colonnades, the circled steps of Roman amphitheatres, and the dark caverned depths of early Christian catacombs, may have furnished the traveller with hours and hours of pleasant dreams. Time after time he may have enacted, in his mind's eye, the scene which made these buildings the wonders of a bygone age. But now, as he gazes on these relics of a far more ancient home, and sees before him the *débris* of twenty centuries, with a wholly different aspect to all the former *tableaux* of decay, his dreams are different, and there comes over him a feeling of strange awe and wonderment as he stands before this silent City of the Dead. Arab tradition, and scant fragments from sacred and secular writers, have hallowed this spot, and thus his memory carries him back to the wild legends of Ninus and Semiramis, and perhaps of the conquering Sennacherib, who swept with his iron hosts the land of the faithful Hezekiah.

Half a century ago the traveller in these regions gazed on this mound, with no greater stimulant to his thought than the scant notices of Scripture, and the wild fabrications of Ctesias and other classic fiction writers; and he, like his Arab brother, had nothing to guide him.

> "Beyond tradition's oral tale,
> Or gleams of truth like waving sunlights pale,
> The Arab knows not, though around him rise
> The sepulchres of earth's first monarchies."

But the very spirit of wonder and fascination which had inspired so many with a desire to tear back the veil of dust and *débris*, and lay bare the treasures hidden, at last found a true disciple in Sir Austen Layard, to whom all the world of arts and science owes the "resurrection of Nineveh," and it was he who at last broke the spell of centuries of slumber which had wrapped its greatness and its glory.

No longer need the archæologist or historian depend on the contradictory stories of such writers as Ctesias, Herodotus, and Diodorus Siculus. Let him who would read the story of Nineveh, and know its streets and palaces, its kings and people, turn to the annals which for centuries have lain deeply buried beneath these tumuli, and which now form the guide-books to the city and its suburbs. Of all the lands which have been the seats of early empires, and from which have spread in regular lines colonies, and settlements, bearing civilisation and culture to the world around, none more clearly indicates in its topography, its growth and history. By the sequence of cities which the traveller will find as he starts on his journey down the rivers of Mesopotamia, he may almost be said to be passing step by step through a long range of centuries. Starting with the tetrapolis of Nimrod, in the delta of the rivers, we find city following city in regular order. Erech (Warka), Ur (Mughier), Akkad, Calneh (Niphur), and Babylon, each succeeded one another in regular sequence as the metropolis of the southern empire. In time the "stay-at-home" primitive population of Babylonia, the Turanian Akkadians, like the Chinese, whom they resemble in so many points, became blended with another race, the roving Semite, the forefather of the Bedouin, and commerce became the incentive to spread out towards the fertile lands of the "setting sun." Assur (Kileh Shergat), Calah (Nimrud), Nineveh (Koyunjik), became caravan stations along the banks of the water-way, the Tigris, the "river of fertility." Gradually in regular sequence, as in the southern land, these newly-founded colonies became the metropoli of the early, middle, and late Assyrian empires.

From very early periods, however, Nineveh was celebrated for its temple dedicated to Istar, or Ashtaroth, the Assyrian Venus, which from time to time had been richly endowed by the early kings of Assyria, especially those who had passed through it on their way to conquer the fertile regions of Syria.

Although one of the leading cities of the empire Nineveh does not come into prominence unt

the middle empire (B.C. 885—700), when it shared with Calah the seat of government.

During the reign of Assurnazirpal and his son Shalmanesar III. (B.C. 850), the contemporary of Jehu, Nineveh often was the royal residence, especially during the long series of wars against Syrian tribes, when, from its northern position, and its suitable situation for the collection of troops, it became more useful as a military centre. Still, however, the southern city remained as the capital *de facto*, and the seat of the administration of government.

It was not until the end of the middle empire that Nineveh began to assume the prominence, which it ever afterwards retained, as the queen city of Western Asia.

Sargon, the father of Sennacherib, had been chief military commander of the weak and short-reigned monarch, Shalmanesar IV. (B.C. 725), the last ruler of the middle Assyrian empire. Sargon, the *tartan*, was a member of one of the aristocratic houses of Assyria, and seems to have possessed the entire control of the army, which, in "the days when might was right," enabled him to step firmly to the throne. This accession or usurpation of the Assyrian throne took place in B.C. 721, marking the foundation of the grandest line of Assyrian kings, and the commencement of the Augustan age of the empire. His character as a military despot only held back the rebellion of his people by the gilded cup of victory which he kept ever to their lips, and his partly Babylonian origin caused him to live away from Nineveh and the other large cities of the empire, and to build a residence for himself. He, therefore, chose to erect for himself a palace at a distance of about twenty miles north-east of Nineveh, on the site of an out-post called *Dur Sargina*, or "Fort Sargon." Here, with the spoil of his numerous campaigns, the king built for himself a royal abode "bright as the sun of Heaven," and from it at various times he paid state or religious visits to Nineveh, Calah, or Babylon.

It was from the ruins of the suburban palace of Dur-Sargina, the site of which is marked by the Arab village of Khor-Sabad, that M. Botta obtained the splendid series of sculptures which now form the treasures of the Louvre in Paris. The palace town of Dur-Sargina appears never to have been the official capital of the Assyrian empire, although in B.C. 688 it supplied its eponym as one of the chief cities in routine to be archon of Nineveh. Calah appears to have still retained its character of the official capital.

On the death of Sargon, in B.C. 705, Sennacherib, his eldest son, came to the throne, assuming the reins of government at a grand coronation festival, held on the 12th day of the month Ab (July 16th), B.C. 705. Sennacherib, who had taken an active part in the affairs of state previously to his accession, came to the throne with a determination to make Nineveh the capital of the empire, and to restore it to all its grandeur and render it worthy of its title of "the Great Fortress, the beloved city of Istar, within which are all the sanctuaries of the gods and goddesses." Situated as Nineveh was, on the Tigris, the main artery of Assyria, this able general saw that it was better adapted to be the centre of the extensive military operations which he had to carry out. To render the city worthy to be the capital and abode of royalty, Sennacherib determined to restore its temples and palaces from the decay into which they had fallen. The state of neglect and ruination which reigned at Nineveh had rendered it totally unfit to be the royal abode, and in his inscriptions Sennacherib very clearly describes the state in which he found it.

"The river Tebilti, a rapid stream, which in its course the ground within the city had cut away.

The palace mounds were burnt and scorched with the sun.

For a long time storms on the palace had come and by a great flood in its foundations openings were made, and its platform broken up."

The river Tebilti (Flowing), which had undermined the palace mound by its force, and flooded all the lower part of the town, was an artificial canal which entered the city enclosure at the north-eastern extremity, being fed from the upper waters of the Khosr-su. This stream ran along the southern and eastern sides of the great palace mound, and when its embankments became neglected, and its streams flooded by the winter rains, it speedily washed away much of the foundation-courses of the terraces and embankment. The western face at the same time had suffered from the violence of the river Tigris so that the lower courses of the mound must have been much undermined.

The moisture absorbed by the foundation-course had caused cracks and fissures, and probably landslips, to occur in the great platform, which rendered it unsafe. There is somewhat of a pathetic tone in the words in which the builder king describes the neglect and disregard with which his ancestors had treated the palaces and temples of this great city.

"Those of ancient time, the kings who had gone before me, my predecessors in the dominion of Assyria and the guidance of the offspring of Bede.

And through an unbroken series of years in its wide entry, the tribute of the kings of the four quarters they received within it.

Not one among them of the interior of this palace as an abode of dominion the smallness knew, and his heart did not desire to repair the circuit of the city or widen the streets.

To excavating the river and the planting of trees his heart was not drawn or his attention raised."

But as the pious king speaks of the divine command which he had received as to the work of rebuilding Nineveh, we see in what a sacred light he regards the restoration of the Holy City.

"To me, Sennacherib, king of Assyria, to the doing of this work by the will of the gods, my attention was directed and my mind brought."

The weak state of the empire, wrecked by rebellion without and sedition within, had so impoverished the kings that they had not the rich spoil and myriad captives to lavish on this work of restoration. Tiglath Pilieser II. (B.C. 742), the last wealthy monarch of the Middle Empire, had poured out all or the greater part of his wealth upon the southern city of Calah, where he had built a rich palace for himself. He appears, from records found on the spot, to have done some little towards the beautifying of Nineveh, especially the Temple of Istar. But with Sennacherib, who had just come into the rich legacy of his father's conquests, it was very different. The spoils of Egypt, Syria, and Armenia, the wealth of Babylonian priests and nobles, and the treasures of the princes of Elam, with many thousand captives whom his father had transplanted to Assyrian provinces, were all awaiting his royal decree to commence the work of his heart, and the desire of the gods. The decree had gone forth that Nineveh should be rebuilt, and throughout all the land was busy preparation.

The captive tribes of Chaldeans and Aramæans, the hardy Minni from the shores of Lake Van, with the border tribes of Asia Minor, were marshalled by the stern task-masters, and drove by drove flocked into Nineveh. From the wooded slopes of Lebanon and Amanus the royal foresters sent down the blocks of rich polished cedar. The strong pine, the cypress, and the light, but pliant, palm were laid under contribution for the royal abode. From the quarries of the Zagros, and the steeper Armenian hills, came the marble and alabaster, while from the regions round the city came the gypsum which formed the chief material for decoration.

When we examine the documents from which the full details of these great works of the builder king are gathered, we notice a very curious fact. The barrel-cylinder, usually known as the Bellino cylinder, now in the British Museum, which contains so full an account of the restoration of the palace, is, on an examination, found to be dated in the "month Sebat [September], in the eponym of Nabu-irba, prefect of Arbela." This officer we know from the canon of archons of Nineveh, presided over the city in the year B.C. 702, or the third year of Sennacherib's reign. This cylinder was found in the foundation course of the palace, and it is therefore evident that if the stupendous works here recorded were completed in the third year of the king's reign, they must have been commenced some time previously to his accession. It is, however, much more probable that the detailed account of the works here given, which agrees in all the chief points with the Taylor cylinder, written in B.C. 691, or ten years later, was in reality a specification of the works to be carried out. This cylinder contains events recorded in the Bavian rock text, which was compiled in B.C. 691, or later, and which relates to the extensive series of waterworks constructed by Sennacherib for the benefit of the people of Nineveh. From the numerous small tablets from Nineveh, Calah, and Babylon, which relate to the repairs and additions to royal and sacred edifices, and which comprise measurements, reports, specifications of material to be used, and orders for material, it is evident that there was attached to the royal household a very important official staff under the clerk of works.

The details of the royal works which have come to hand in the copious inscriptions of Sennacherib, are all the more interesting because they happen to be accompanied by one or two large whole-plate illustrations, drawn by artists who saw the works in process of being carried out. The sculptured slabs which now adorn the south side of the Koyunjik gallery of the British Museum, form a series of large folio plates which very clearly illustrate the works which, in the year B.C. 701 and following years, were in progress on the site of Nineveh. Here we see most vividly depicted the scene which was daily presented to the spectator who visited the works. Within the enclosure are to be seen the workmen and bands of captive slaves, toiling in unbroken line, hour after hour, to raise the lofty mounds on which were erected the royal palaces. The river is alive with small craft; the boats, constructed of skins and twigs, bearing to and fro the workmen. Alongside the temporary quay is moored a vessel, half-boat half-barge, on which is placed a ponderous block of stone, which has been floated down from some adjacent quarry, and which is waiting to be submitted to the hands of the royal sculptor, to be moulded into one of those "unwearied warders" of the royal portal. In another sculpture we see one of those winged protectors of the royal paths being drawn by the united strength of great bands of captives into its position on the mound. In the inscriptions the royal architect thus specifies the wondrous statues:—

> "Doors of Liyari wood, plated with shining bronze,
> I fastened and hung in their gates;
> From white alabaster, which was seen in the land
> of Balada, winged bulls and great lions I made;
> On the right and left I placed them."

In another text the king calls them "guardians of the royal paths," and it is evident that they were regarded as divinities, for the names of both lions and bulls have the prefix of divinity attached to them.

The splendid bronze-covered gates which have been discovered by Mr. Rassam at Balawat, now enable us to form an idea of the splendid portals which gave entrance to the royal dwelling, and before which the nations of the Eastern world poured out their tribute and offerings. These brazen-plated doors, which were to be found in Assyria as early as the ninth century before the Christian era, were evidently the origin of the brazen-plated walls of Grecian edifices. In fact, almost contemporaneous with these brazen gates of Sennacherib's palace we have the bronze-chambered treasury of the Sikyonians at Olympia, which is described by Pausanias, and the bronze temple of Athene Chalkioikos at Sparta, in which it is evident that the decoration was by plates of bronze attached to the stone walls. In the heroic epic of Homer we have bright copper walls of the palaces of Alkinoos and Menelaos; and in the treasury of Atreus, at Mycenæ, there have been found the brazen nails which held the plates decorating the walls.

In the specification of his works given in the Bellino cylinder, the royal architect states most carefully that "of the written records of my name 160 *tipki* of the surface of its interior I wrote, and beneath its foundation I left for future time." This evidently refers to the stone sculptured slabs bearing illustrations of his wars and brief inscriptions, and also to the *timen* or cylinder which was placed in the foundation course. In another passage in this same cylinder these foundation records are most accurately described. "The ancient cylinders, very old, which from old times with writing were impressed, its lines were ruled, its enclosure [cell] was fixed." The king speaks most reverentially of these ancient foundation records, which he discovered and which he replaced with great care. It is perhaps to a similar reverence to his records by his successors that we owe the preservation of these cylinders, which tell us so much of the story of buried Nineveh.

The address to his successors, which forms the prologue to this incription, is very interesting:—

"That palace, from its foundation to its roof, I built and perfected.

Inscriptions, the writing of my name, I placed in it.

In after days, among the kings, my sons, whom Assur and Istar

To the government of the country and people shall proclaim his name.

When the palace becomes old and decays may the latter prince its decay repair.

The inscriptions written in my name may he see.

An altar may he raise, sacrifices may he offer, to its place may he restore it.

Assur and Istar his prayers shall hear.

The destroyer of my writing and my name

May Assur, the great lord father, of all the gods, as an enemy oppose him.

Sceptre and throne may he take from him, and may he destroy his life."

This address, which was the standard legal termination to these foundation records, is, perhaps, one of the oldest examples of the conservatism of the law in its phraseology. In the stone tablet from Kileh Shergat, which contains the description of Samsi Rimon II. (B.C. 1300), and which is written in the old archaic or black letter type of Assyria, we find the same formula with only mere local variations. In the cylinders and royal texts of all the Assyrian kings, from the time of Tiglath Pilieser I. (B.C. 1120), until the texts of the last feeble kings, the sons of Assur-bani-pal, who died struggling for the throne, we find this formula. In some examples the blessings or cursings are largely increased, and are interesting for their poetic nature. In a tablet now in the British Museum, which was discovered by Mr. Rassam, in his expedition of 1877-8, we have the following interpolation :—

"Who this tablet shall see, and curses upon it shall utter, Istar, the Lady of War and Battle, his weapons shall she break, shall injure him, and spoil him.

He who this tablet shall see, and shall take it up, the faces he shall clean, and victims he shall slay before it, and then to its place shall restore it; Assur the great lord, his prayers shall give ear to, and in the battle of the kings in the place of the onset [of battle] the courage of his heart he shall find for him."

The custom of offering victims before the record tablets of his ancestors here recorded by Sennacherib calls to mind the worship of the Manes among the Classics and the offerings to sepulchral tablets in the Celestial Empire.

In these beautiful words, poetic in their original language, and containing much of the feeling of the Hebrew psalmist, the royal restorer of Nineveh and its palaces bequeaths them and their treasures to his descendants. It is beautiful to note the simplicity of the theology of this final bequest of the king. "Assur and Istar shall hear his prayers," "Assur, the great lord, father of all the gods," shall punish his neglect. Assur, the national patriarch, the deification of the nation, the father *par excellence*, shall hear his prayer, if he honour his father's records; but if pride and arrogance shall so fill his heart as to seek to neglect and destroy the annals of his predecessors, then that same Assur, both abstract and material, as the nation, shall avenge the insult thus given to its heroic kings. Istar, the mother, the queen of love, shall favour his suit with many a fair-faced bride. In war, she, as the "queen of battle," as the Bellona, and Venus Victrix, shall shower upon him the crowns of victory. Inspired by her favour, and confident with her support, he shall have courage and boldness to attack all opponents. But rich and capricious in her love, so was she the "war's dread queen," stern and unrelenting in her vengeance. With broken weapons, smitten down and spoiled of all his rich treasures, he shall stand forth as one who respected not the fathers who begot him.

How grand was the legacy which the hero-king bequeathed to those who should rule the people of Assur. The commencement of his reign saw Nineveh a ruined and almost desolate city. Its palaces were wrecked and weather-worn, its streets and squares neglected, and the uncontrolled floods had swamped its lower town. But now what a change has the builder king brought about in his beloved city. From the banks of the rapid Tigris, now banked and controlled between broad quays, there rise in stately grandeur the broad-terraced mounds, on which tower high to heaven the palace homes of the king of nations:—

"Whose eaves with gold, whose walls with vermeil blazed:
With aisles on aisles in lustrous long array,
And opal domes that flash'd a blending ray:
There fringèd palms for ever waved a shade
O'er gay deck'd roof and chequer'd colonnade;
There sheeny fountains danced, there hung on high
The terraced garden's leafy tracery,
And many a dreamy paradise between
Peep'd mid the glare, calm isles of dewy green."

Nor had the father of his people neglected the wants of those he ruled. From the slopes of the Zagros he had drawn the sweet waters, and by skilfully-contrived canals he had brought them down to Nineveh. Along its banks were lines of verdant trees, and all the fair plain, now rich in culture, was divided among the sons of Nineveh.

"Oh, gorgeous vision! when this sunlit plain,
Rippled in golden seas of ripening grain."

The period of depression which had preceded the accession of the Sargonide dynasty, had caused the agricultural portion of the Assyrian population to neglect the works of irrigation which once fertilised the plains of Nineveh. The canal banks were broken and washed away, the channels were blocked with drifted sand and *débris*, the whole land thirsted, and the rains from heaven failed to supply the necessary quantity.

In the rock inscription at the village of Bavian, about twenty miles from Nineveh, the King Sennacherib tells us of the great works which he carried out in the construction of the "Royal Waterworks and Irrigation Company" of Nineveh. The king speaks of the works which he had completed, or was completing, in Nineveh:—

"At that time, of Nineveh the site I enlarged, the tower and outer rampart, which in former times did not exist, anew I caused to be made and erected skilfully.

The conduits which were without streaming waters.

And the princes and men [of Nineveh] for drinking-water did not know, and to the rains of heaven were turned their eyes."

The Assyrian king, aided probably by an extensive staff of civil engineers and Babylonian canal builders, set about the important task of regulating the water supply of Nineveh.

Amid the cool and shady glens of the Tiyari range, the western branch of the Zagros, the king found the rich flowing streams from which to cool the thirst of Nineveh. The site where stood the small town and temples which surrounded the great reservoir of Nineveh is now marked by the village of Bavian. This spot was explored by Sir Austen Layard, who found there the remains of the buildings, temples, and reservoirs which had marked the site of the royal waterworks. There was every indication that the various streams which had flowed from the rocky slopes had been carefully collected and stored in reservoirs or basins. The lower one of these basins had a fountain from which the water issued into a larger reservoir, the decoration of which is very interesting. From the centre of an oval the water pours out in a regular stream into a neatly-cut basin, which, overflowing, the water falls into the main reservoir. On either side of this orifice are two rampant lions, and one cannot help contrasting the whole arrangement of this group with the rampant lions on the Lion-gate at Mycenæ. There is the same lank drawing of the figure, and a somewhat close resemblance to the dog in the work which led archæologists to note the Assyrian feature of the work at Mycenæ.* The sculptures and bas-reliefs at Bavian show very clearly that, like all the canals, rivers, and lakes of the land of rivers, these works were dedicated to the Assyrian Neptune,—the god Hea. The chief bas-relief represents the great Isdubar or Nimrod, the *protégé* of Hea, slaying the lion, and he is attended by his boon companion, the satyr *Hea bani*. "Hea created" the Pan, or river god of Assyrian mythology.

From this fertile spot, which was possibly a favourite summer retreat of the Assyrian king, by a series of skilfully-constructed canals the waters were conducted to Nineveh.

The king utilised the natural bed of the Khosr river to a considerable extent, at last conveying the waters into the moat and ditches of Nineveh by a short junction canal.

"(a.) Eighteen canals I caused to be dug, to the midst of the Khusur (Khosr-su) I directed their channels.

(*b.*) To the interior of Nineveh a canal I excavated, their waters I caused to descend within it. 'The fountain of Sennacherib' I called its name.

I brought the mass of waters from the land of Tas [the fountain]."

Right and left of this main artery of irrigation the king constructed tributary canals, bearing fertilising streams over all the plain which was now rich in cultivation.

* Layard, "Nineveh and Babylon," p. 345.

"Beautiful plantations like Hamanu (Amanus), which were all choice and select trees.

Trees, the glory of mountains and plains, within its grounds in rows I planted.

As regards the planting of trees in the fields in the neighbourhood above the city of Sapitan.

To the sons of Nineveh in divisions I divided and entrusted to them."

Within the city enclosure, now drained and cleansed by the captive labourers, were the broad streets and palaces, the market squares, and on the west side the Palais Royale, with its stately towers and terraces, and its broad and richly-cultivated gardens and parks. In an inscription discovered by Mr. Layard on the Koyunjik mound, there is one passage which has strangely escaped the notice of Assyriologists, in which we gain an insight into the topographical arrangement of Nineveh. The king, in speaking of the park or paradisus which he made in Nineveh, states,—

"At any future time of the inhabitants of this city, who ever his house being old shall destroy and anew shall build, if the foundations of his house into the walks of the king run, the top of his house into the dust they shall throw."

The contract tablets, examples of which we furnished in our article on Babylonian land-laws, showed the accuracy with which house or landed property was specified and regulated. The examples there quoted proved the houses to have been arranged in streets or groups, and with land about them. It is evident that like Mosul and Baghdad, Nineveh had within its *enceinte* the gardens and parks of the nobles of Assur, and was not one mass of clustering houses, or stone-paved squares. Breaking the northern rampart, and forming the outlet to the fertile plains along the Tigris bank, was the royal gate of Nineveh,—a double gate, flanked both towards the city and the plain by gigantic human-headed bulls, 19 ft. in height. Within it were the broad and roomy chambers of guard, and above towered the "ziggurat," or watch-tower, which overlooked the plain. Upon the broad flags which pave its surface, may yet be seen the marks of the chariot-wheels which once hurried through its portals, bearing the conqueror home.

Through this wide entrance have passed strange crowds of men. Captive and conqueror, suppliant king, and strange-featured and stranger-tongued ambassadors, have passed this entrance to Nineveh. Beneath its arches have passed the tribute-bearers of Tyre and Zidon, and the humble embassy of the Hebrew monarch Hezekiah. Through it have entered the triumph trains of the conqueror of Egypt and Ethiopia and the "sea-bound" Cyprus. The messengers of the Lydian Gyges, with their strange presents, and speaking a language which "none of my people knew," thus entered to the presence of the conquering Assur-bani-pal.

Yet, amid all its grandeur and power, there was in the "home of Sennacherib" a solid omen of the coming doom of Nineveh. That triple line of ramparts, more than two miles in length, those lofty watch-towers and the deep moat which formed the eastern barriers of Nineveh, prophesied by their presence the quarter whence would come the doom of Nineveh.

That powerful combination of the enemies of Assur, the Babylonians, Elamites, and the Persians, Medes, and Parthians, whom Sennacherib so terribly defeated in the historic battle of Haluli (B.C. 691), were but the advance-guard of the great horde which, seventy years after, made Nineveh a heap of ruins.

Those men whom he so cruelly defeated at Haluli, who saw the terrible vengeance he worked on sacred Babylon, were but the ancestors of that rebel horde who, in the year B.C. 626, swept down on Nineveh and wreaked a terrible vengeance on the queenly city, rendering it a heap of ruins from which she never rose.

"The world grew old,
And still that city slept, unsought, unknown, untold."

The Cross of the Legion of Honour: Paris Exhibition.—The French Ambassador, the Comte de Montebello, writes: "I have been instructed by my Government to make it known to several tradesmen in this country, upon whom the decoration of the Légion d'Honneur was conferred on the occasion of the last Universal Exhibition, that this distinction is merely honorary, and should not, at any rate, be used as a means of publicity or a recommendation for their trade."

ART IN THE SCHOOL AND ART IN THE HOME.

THE members of the peerage who are accustomed to receive and accept invitations to preside at anniversaries of useful as well as ornamental institutions are not numerous. The same names catch the eye over and over again; even of these it may be that some may not uncharitably be believed to respond from zeal that is largely compounded of pure good nature, combined with not unjustified confidence in popularity. Certainly on some occasions it is not very easy at first to find the middle term of this syllogistic combination of popular interest and aristocratical distinction. Still there are cases, happily, in which men from our highest ranks give good proof that those ranks are not destitute, in our own day, of worthy successors of the high culture and liberal genius of noblemen of days gone by, before an exaggerated head of game was threatening to become universally the be-all and the end-all of aristocratic ambition, so far as it may not be engrossed by the solid allurements of party position and influence and power. It was said of the Duke of Wellington, in his later days, that he could not bring himself to believe that an officer who had risen to the appropriate rank was not necessarily equal to all its most special duties, provided only he was also highly connected. The official leaders of some of our public bodies no doubt seem to have a still more assured conviction that a title will be found to furnish a complete set of intellectual and artistic graces and accomplishments, and fully efficient power of exposition. They open their Peerage a little at random, on the principle of the *sortes Virgilianæ*, and take what fortune gives. On the whole, however, we advance in discrimination. The Architects' Institute has for some time dispensed with the Corinthian capital that was once held indispensable; the Royal Society seems to stand in awe of being reminded of a former president Royal Highness, who betrayed how little scientific knowledge on his part had brought the crowd together, when, referring to the heat of the rooms at Somerset House, he addressed the Arctic navigator,—"A change this, Sir Edward; more like the South Pole than the North!" Nevertheless, there can be no doubt that, if worthy representatives of political power and high political principle, or of those associations which cling to the descendants of distinguished ancestry, can only prove that they contain genuine sympathy for the arts and sciences, the pure or the applied, and also have attained to meritorious distinction in them, or even to a faculty of eloquent expatiation upon their distinctive characteristics and advantages, then social benefit is by no means trivial that accrues from the courteous recognition of fellowship with those whose qualifications may be more purely special. Somewhere among these considerations is to be found the explanation that the name of Lord Carnarvon seems to take its place gracefully at the head of a notice of a gathering that in itself has but little relation to the burning subjects with which he has dealt in high offices of state. The Antiquaries have not unfrequently to thank him for a lucid summing-up of the bearings of arguments in a diversified and complicated discussion; and when we read the announcement that his name has been added to the list of the translators of "The Agamemnon of Æschylus," a title is established for his being respectfully listened to in his observations upon Greek art, and its relation to the art of our times.

Unconsciously and unintentionally these remarks have fallen into a tone of liberal and candid allowance, which sometimes warns us to prepare for a revulsion to depreciation and disparagement. But any apprehensions that may have been excited,—we will not suppose the possibility of an anticipation of pleasure at such a rhetorical back-stroke,—may be dismissed. The observations which his lordship addressed to the students of the science and art schools at Newbury, in distributing their prizes, seem to us very much to the purpose, and worthy of being even further insisted upon; or, if that is not necessary, they are still so far stimulant of collateral illustrations as to make it natural to refer to them as furnishing a text.

Let us leave aside, then, the topics of the principles of art study which were very justly enforced by the example of the Greeks, and pursue in preference the train of thought suggested by some sentences which referred to the uses of artistic accomplishments when they could be supposed to be mastered. And even of these we will leave aside the very important mercantile aspect,—albeit the mercantile value that cultivated talent can confer upon materials comparatively valueless is important enough in other countries, and might be so in ours, to touch the soul of a Chancellor of the Exchequer "steeped to the lips in money-bags and ledger." Let us dwell for a moment on the functions of art in the home,—of art as it may be a joy and possession for those who are not, and have no intention or desire, and indeed have not the capacity to be professional artists, or even to employ what secondary artistic faculty they may acquire in connexion with their special vocations, manufacturing or otherwise. Indeed, as art schools extend and become more and more frequented, a word of warning may well be called for. To many of the students the discovery of what results they can achieve after diligently adhering to a well-guided system of training will come as an astonishing and, it may be, an intoxicating revelation. It is really quite intelligible if they mistake such success as a proof of the possession of genuine talent, which would be rash enough, or of genius itself, which were absurd. It is quite certain that immature talent is frequently chargeable with productions that it is difficult indeed to recognise as exhibiting a germ of talent, and that only the most perspicacious of critics perceive is just set upon a level with work that is the acme of labourers who will never get a step beyond. How easily may these sanguine labourers themselves be deceived when even the independent critic wisely hesitates and is silent.

The self-knowledge of such conscientious but ungifted workers may too frequently,—does unhappily too frequently,—come too late to save them from launching on careers of disappointment. True it is that a worker in art who is destined to very high success has frequently to endure the grief of most varied and continued failures, before he discovers in what direction his true and strong power lies. But what is not the dreary desert that is traversed by one whose certain destiny it is to make certain, even to himself at last, that he is without any originating power at all. So it is that one of the chief problems of life is set us to resolve at the very commencement. Happy is he who at an early age can know his true artistic or non-artistic self. Friends here can give but little guidance, and critics, who, if not unfriendly, are under no obligation to be friends, can give none at all. The student has to rely upon something like a faculty of divination that his self-confidence is born of a living, if yet undeveloped, force within. It is an observation of Adam Smith's, in his book on the "Moral Sentiments,"—a book which has wisdom in every page, if we only discount the fallacy of the main argument,—that fathers are often wrong in interpreting the self-confidence of sons to youthful self-conceit; it is often due, he says, to the genuine sentiment of a force which is destined to declare itself effectually in time. But what a task of self-examination is proposed for a student who has to hold the balance in his own case between the chances of vanity combined with vigorous resolution in one scale, and lofty aspirations, allied only to "trembling hope," in the other. All the advice that can be usefully given is,—for the student to apply with plodding resolution, on the one hand; on the other, to vary the direction of such application by occasional but swift transitions,—to follow forth with resolution every hint that seems to give the new light of a pregnant novelty; and, finally, to take accurate and resolute note whether faculty as well as facility manifestly developes,—and not to blanch at facing the fact when it becomes too clear that both are but moving round and round a tether.

But when artistic power at last declares itself as of such a character that it can never sustain itself in the thin air where the more highly endowed career with safety and with grace,—when no mercantile application of it is within reach, any more than any access to the proper artistic professions,—what may be, what may not be, then, its contribution to the value of life? Surely very much in many ways, and for many various habits and conditions of living. Let us take an example of a very usual musical experience. Music gives great pleasure to many who never could produce a note that could be called truly musical either with their voices or with an instrument,—nay, not with one of those instruments which, like a flageolet or an accordion, seem invented to provide musical notes that shall be capable of being evoked by merest mechanical action. Some delicacy of manipulation proves necessary even with these, and the congenitally incompetent has to fall back on the comfort which is well worth having, that at least he derives pleasure from the harmonies which others can produce. He may be shocked sometimes to find that he is not instantly aware of lapses in time at which others flinch in painful sensitiveness; but at least, the better the music is the more he enjoys it; others must find out why. This, in truth, is the condition of great numbers, and to these great pleasure may be ministered by domestic performances on the part of those who are musicians up to a certain point, though considerably below the standard that would qualify them for artists. Why is not the flute, why is not the fiddle, more frequently heard in humble houses? Music is fitted equally for solitary and for social enjoyment. Where combined performance is practicable it has the advantage of furthering the courtesies of life by enhancing motives for mutual good manners and good feeling. This was a chief advantage which the typical "great moralist," Johnson, recognised in cards. But to cards as a popular source of amusement there are just objections. Mere games of chance are amusements for the merely besotted or idiotic, and the other class of games into which skill enters together with chance, have temptations of their own which the world is becoming every day more alive to. There are signs abroad that whist, so long the acknowledged king of games, can scarcely long be saved unless some even recognised signals which are to the disadvantage of the less proficient are authoritatively proscribed. The very fact, however, that a stake is naturally required to give zest to the amusement, removes it from any title to compete with truly liberal arts for the occupation of liberal leisure.

Another art which has a reserve of delightful and refining interest is that of reading aloud. The art of reading prose with disciplined effect is rare indeed, but there is no reason why it should be. Like the other arts, it must be acquired by application, study, and the best guidance obtainable. The strengthening of the voice, and the attainment of full command of its resources, are preliminary requirements. Among the ancients there was a class of professors who undertook to do for the speaking voice what others effected for the strength and activity of the limbs. As a class they were by no means charlatans; and it is a pity that they should not have as skilful and experienced successors in our own time, available for many more than ever intend to exert their voice,—at the bar, or in the pulpit, or in public assemblies. To read poetry well makes a much greater demand upon natural and cultivated powers than the ability to read very competently well even highly-impassioned prose. Great delicacy of intonation is required for the force of metre to be duly indicated, and yet not insisted upon with such slavish observance as to obscure the grammatical distribution of clauses and the higher rhythmical movements of feeling and energy. A great deal of the finest poetry, of course, demands in the reader an unusual intelligence, and a great deal can only be delivered effectively after careful study and acquired familiarity with it beforehand. Even such a noble poem as Browning's "Cleon" would be apt to be largely unintelligible if read without such preliminary attention; whereas when read aloud with due emphasis and expression it is lucidity itself. Still, in the case of poetry as of music, there are many who naturally can make light of what are difficulties all but insuperable to multitudes of others,—and the society need not be very numerous that should include more than one. It would be no trivial addition to the best embellishments of life,—of what is ordinary, and too generally is common-place, life,—for hours of rest and recovery to be frequently enlivened, and as if by matter of course, with a scene or an act of Shakspeare, a book of Pope's "Homer," an episode from "Paradise Lost," or a poem of one of the band of our contemporary poets. These are delights that the cheapness of literature now makes accessible to all who have only the wisdom to improve their opportunities.

And now the materials of art are almost as cheap as the resources of literature. There is every inducement for large numbers to employ them as materials of fine art in the true sense of independence of any purpose to turn them to use in the strictly economical sense. If Fine Art were personified, perhaps she would have reason to flush with indignation at finding her-

self so constantly recommended to favour on the plea that, her proper title notwithstanding, she was in reality useful art. Those who are bound by circumstances as well as by the bent of their endowments to the service of some properly useful art are precisely those who will fly for solace, for enjoyment, for reward that has no farther ulterior design, to the cultivation, such as it may be, of one branch of fine art or another. The art of sketching is one which no surroundings make impossible. There is not a window in London that does not open upon some scene or allow sight of some effects that might tax the powers of the best painter to do justice to, and that may fairly exercise those of the merest beginner. If this may seem too much to say, draughtsmanship can always find subjects within doors, or introduce them. Greatly to be welcomed are those improvements in various copying processes, which reproduce so much beauty at so trivial a cost; but even those who appreciate these most, may feel pleasure still in seeing on their walls performances of their own,—mementos of scenes visited at intervals, of places of former residence, of objects endeared by domestic associations. Many is the drawing that would hopelessly sue for admission into any public exhibition whatever, and hopelessly would be offered for sale anywhere, that nevertheless contains merit enough to deserve preservation even by those who are indifferent to its origin, while it may be justly treasured by those to whom it is a link in the association of years. Surely there is no reason why the present opportunities for learning the elements of drawing and painting should not be so far improved,—that drawing and water-colour painting at least, should be among the prized relaxations of the workers whose most active hours are employed in very contrasted labours, but whose anxieties end as the hours of daily labour come to an end.

There is another most advantageous field for the employment of art in the home by those who can exercise a certain amount of artistic faculty, though with no more pretence to be professional artists than a pianist who charms a domestic circle aspires to be a central attraction at popular concerts on any day of the week. Very large are the returns of comfort and pleasure derivable from the investment of good taste and spare hours in the adornment of ordinary living-rooms. Carpets, wall-papers, dados, doors, and mantelpieces, are the ground and the background of which the relation to daily existence partakes no little of the importance that a painter recognises in the background of his picture. Exceptionally fortunate, or more probably, unfortunately insensitive, are they who have not been conscious of a serious reduction of complacency ascribable to the mere tone of colour in seaside lodgings or dignified hotels. Here the mischievousness is but moderate, because only temporary; and the offensiveness may be escaped from before we have been wearied into enduring, and hardened into disregarding it and tolerating it. It is otherwise in a home; yet how many dull and dreary apartments might be enlivened, how many that are veritable chambers of all horrible chromatic discord, might be harmonised, if the instructions of schools of art should truly develope a love of beauty and a sense of harmony. Paper-hanging and colour-washing are arts quite as easily mastered as certain ornamental accomplishments that do painfully and ill what machinery is always doing cheaply and much better. The power of truly realising a magician's dream in a suite of rooms with ever fresh surprises is the privilege of an Alma-Tadema; but the late Mr. Bonomi gave an example of how very simple might be the means and the expedients that, with good taste to boot, could superinduce vivacity and elegance upon very plain and moderate preparation. It may seem that when good taste is postulated we are begging the whole artistic question; we are taking for granted as forthcoming the very condition of which the possibility is most precarious. For this there is no help. In one respect, no doubt, it may be said that inasmuch as all our suggestions proceed on the too-readily-granted assumption that there is a vast expanse of bad taste now developed spontaneously, that if not superseded can scarcely be aggravated, the danger in any case is unimportant. But, of course, it is to be understood from what has been premised that it is for good taste of considerable, though not precisely of merchantable, value that a field for exercise is being indicated. The subject is treated abstractedly, theoretically, speculatively, but it may be frankly said that no more is suggested than has been witnessed in practice and approved by most welcome and gratifying success,—the transformation of what had been playfully known as a "den" into a bright and cheerful haunt. Flowers slightly but gracefully thrown upon panels; mouldings defined by a few painted lines of varied breadth; the colour of the walls that was under command happily adjusted to relieve the fixed condition of the carpet; ruthless suppression of the more valuable but inharmonious material of a sofa-cover; ambitious carving of the mirror-frame relegated to absolute seclusion: little more than this and the work was done. The very progress of such a work is a discipline and an experience of the highest value; for, even when considerable taste and manipulative skill are employed, failures will occur,—improvements will recommend themselves. We know not whether such a true domestication of art in a number of homes within the circle of the influence of an art school will not be a still higher triumph for it than standing even very high indeed in the list of recipients of gold and silver and bronze medals and honourable mentions.

THE TRUE SCALE FOR MINERS' WAGES.

Both parties to the great contest in Durham admit a certain deference to the public opinion of the country. It can hardly be otherwise. Were no such admissions made, the fact could hardly be doubted. On the other hand, there is a danger that the acknowledgment may be proposed as a payment, and that the desire to avoid public reprobation may be stronger than the real intention to take any counsel from by-standers.

The men are said, by one report, to be discouraged at the general unanimity of the press against them. As far as those regrettable instances of violence, which are as natural attendants on a great labour conflict as sharks are on the course of a ship with illness on board, are concerned, there is no doubt of this unanimity, and that not in the press only, but in the public sense and in the public will. Beyond this, we think that the most general outcome of the sense of the press has been the expression of wonder at the time selected for the strike, owing to the apparent absence of such promise of support as alone would give it a chance of success. This may or may not be so. In our own remarks we have not expressed any opinion as to what we may call the politics of the contest, for the good reason that we have not before us that full and complete information on which alone anything like a judicial decision can with any propriety be based.

Under these circumstances, we suggest that the party which, in its own intelligent consciousness, feels most clearly that it is in the right, would do well to make an open and candid appeal to the great assize of public opinion; and that not by coloured statements, or one-sided views, however honest. We do not want to hear any more opinions, either from the Coal Owners' Association or from the Miners' Association. In point of fact, abstraction being made of all colouring or clothing, the two parties have joined an issue which it is quite possible to decide, if the evidence is brought into court. And we take leave to point out the manner in which this can be done, so as to carry full conviction, at least, to persons like ourselves, who know something of work and something of wages.

We ask either party, and especially the party most conscious of right rather than of might, to publish three simple documents, on which the public and the press may form their own conclusions. Let any Durham colliery, that is not disturbed by exceptional causes, be taken as a specimen. Let a month's pay-sheet of that colliery,—say, for instance, that for March in each of the years 1867, 1873, and 1879,—be published. Added to the pay-sheet should be a statement of the quantities of coal raised in the month, and the average market price. The importance of the former item, as bearing on the question, may be estimated from the fact that in 1867 each miner on the average won 315 tons of coal in the year. In 1873 he won only 273 tons; in 1874 only 249 tons. What he won in 1879 we are not aware.

Per-centages are all very well for those who understand them. But it is clear that very different ideas are held of what they mean. By the plan we propose, every one accustomed to the elementary rules of arithmetic will be able to make out for himself what were the average earnings of the whole colliery population, and what the detailed averages of the underground and surface labour, in the years we have named, and also what return the colliers gave for their pay. One bit of positive evidence of this nature will be worth whole libraries of speeches; and if the information is refused, the public will draw their own conclusions from that simple fact.

It may be said that the miners have no copy of pay-sheets. In that case we ask, what information of the kind can be obtained from the records of co-operative associations? Again, the masters may say that they do not wish to give the details of their several works. It is not necessary that the mines should be pointed out by name. All that the public will require are definite and reliable facts, on which to base their own judgment. If the scientific press is to act as a jury, it should be enabled to come to a conclusion on evidence, apart from the pleading of counsel on either side. If in each year we have indicated we had the total payments in labour in a selected colliery; the total number of hours' work of men, above and underground; the total number of hours for which the engines were at work; the tonnage of coal raised; and the average selling price; we should probably have all that is necessary. The detailed pay-sheet would be the most convincing document; but the abstract, if signed by a name or names that afforded a pledge for accuracy and good faith would, no doubt, answer the purpose. The importance of this contribution to the public knowledge of the matter will be obvious from a little reflection.

From 1871 to 1874, the miners admit, wages rose from 100 to 150. In the same three years the yield of our collieries fell from 318 to 249 tons per man employed, or very nearly 22 per cent. The difference to the coal-owner, therefore, in his expenditure, was not 50 but 72 per 100. Nor does this represent the whole of his loss. If, at the same time, the number of hours for which the engines are at work were diminished, say, for example, from 60 to 54 hours per week, a further loss, amounting to 10 per cent. on the returns of the plant and fixed capital of the collieries, was incurred. Thus, instead of the outlay of the master being increased by only the 50 per cent. nominal increase of wages, it was increased in those three years by at least 72 per cent., owing to the diminution of the production per man at the higher wages; and if short time was added (which we rather think will prove to be the case), the cost to the master was doubled, or nearly so, during the inflation of those years.

The diminution in the output per man was steady, year after year, from 1867, when it was 315 tons, to 1874, when it was 249 tons. In 1875 it had risen to 253 tons; and this is the last year for which we have the figures. It is clear that the diminution of wages from 150 to 105½, and then to 90½, will not put the proprietors of our collieries in as good a position as they were in in 1871, if the output of coal per man is only 78 instead of 100, and the time for which the machinery is at work is reduced from 60 to 54, that is from 100 to 90. The men will be paid, no doubt, 9½ per cent. less than was the case in 1871. But they will be earning for the masters 32 per cent. *less*,—supposing the selling price to be the same. But the price for coal at the pit-mouth, which has reached the maximum of 15s. 6d. per ton, is now quoted at 4s. 7d. per ton.

This *brief précis* of the admitted facts is enough to show how idle it is to beat about the bush, and for one party to complain of the other, while the real knot of the question is unsolved. In our opinion a very short day's work is the proper thing for mining work. But this is only economically possible by the shift system. We have before shown that if three shifts succeed one another, so as to keep the engine and machinery always at work, the best economic results are attained for all parties. Next in advantage is a double shift, working for sixteen hours in all. But if the time be shortened, the work per man reduced, and shift work not employed, it simply becomes a question of the market price of coal, how soon it is better permanently to abandon a colliery.

We shall be most happy to insert any corrections of the above, furnished by either party, on the one condition that they are put into definite form, so as to be capable of numeric valuation, in the mode above sketched out.

A MINISTRY OF HEALTH.

IT is an open question whether there should be, forming part of the Government of the country, a Ministry of Health. Dr. Richardson pleads earnestly before the public that there should be such a ministry.* Whether it ought to be established or not depends upon what it could do, and what the people legitimately desire. If it can and will fulfil the proper needs of the people, it is clearly desirable that it should be established. Let us first see what Dr Richardson says upon the subject. The addresses are nine in number, viz., a Ministry of Health; a Homily Clerico-Medical; Learning and Health; Vitality, individual and national; Registration of Disease; William Harvey; the World of Physic; and Ether-drinking. He says that the basis of a ministry of health is already laid in the office of the Registrar-General.

It is by a modification of, and additions to, this department, as it now exists, that the new official and governmental institution should be established. The department should be no longer for mere registration, but should include all that relates to health. In addition to the duty of collecting the registrations of births, deaths, and marriages, it is proposed that the ministry of health should collect the registration of disease throughout the kingdom. A complete system of registration would be established, not only for the diseases which affect human kind, but the diseases affecting animals and plants in every locality. It would include also the meteorological returns, the coroners' returns, the work now carried on by the Local Government Board, and, in addition, it would collect the leading facts of the reports of the medical officers of the kingdom, into a form which would serve as a permanent history of the results of sanitary progress. There would be brought under the same direction the adulteration reports, factory supervision, prison and police supervision, and supervision of public works. The Council, it is proposed, should have for its members, in addition to the Minister of Health, a statistician, a physician, a factory surgeon or physician, a chemist, a veterinarian, and a sanitary architect and engineer.

It is stated that there is a necessarily close relationship between the functions of the clergyman and the medical man. In making his first inquiry into this relationship, Dr. Richardson asks where are the relationships the closest? When should they be of accord in practical labour? Where can they join to do work together in the same spirit without interfering with special functions? On what ground do they still remain both priests and physicians? If we could see this land of union, we should see, indeed, a land of promise for the world.

In the combined study of the inter-relationships of clerical and medical functions in things which relate to both physical and mental health, they stand, says Dr. Richardson, on common ground, for it is their combined function to check physical and mental evils at their roots. Their common labours concentrate in the study of all deranged conditions of mind and of body, of sins and diseases in past and present generations. The clerical and medical functions interrelate when they are directed to the suppression of all vices which bring in their train physical disease. The minister of religion cannot convey his meaning to the mind of a man whose senses are unfitted for the reception of the pure, the beautiful, and the holy. On the subject of education, Dr. Richardson speaks very strongly against the modern system of forcing children to learn what they naturally cannot comprehend, making of them mere machines of knowledge at the best; never of wisdom; too often of such flimsy knowledge even that they had been in after-life better without it, seeing what injury is done to their physical, and also mental, health, in acquiring it. It is his business, he says, to declare that at this time health and education are not going hand in hand; that the whole head is sick, and the whole heart is faint. To see the errors that prevail, and not to speak, were to be silent upon errors which would lead a nation into trained feebleness, which would lead to new generations springing out of that feebleness, and to the propagation of a community incapable of illumination by any greatnesses of the past. The writer's argument is that the present modes of education for the younger population, and for the older, are not compatible with healthy life; and that education, therefore, is not producing the mental product that is required for the steady and powerful progress of the nation.

The influences modifying vitality divide into three classes; first, there is a class which is largely uncontrollable, as it includes the great accidents of nature; secondly, there is a class of influences which is largely controllable, but which produces as yet also a calculable mortality. These influences are of the nature of floating poisons which pass from man to man, and even from the inferior animal to man. They are already to some extent brought under the governance of science, and the author believes they will be ultimately suppressed "by the vigilant learning and art of a profession which will never rest until it has shielded the world from these attacks on its vitality."

Then there is a class of influences which spring from individual causes of error, and which of all others are most potent for evil. They depend upon errors in the individual life which, multiplied by imitation and training, become the self-inflicted wounds of the nations. These, after all, it is said, are the chief sources of reduction of vitality to its present low status. In their presence the art of the physician is powerless. Dr. Richardson considers that cremation is simply impossible, as a general principle, at this imperfect stage of civilisation, although in cases where persons might desire it for themselves it might be permitted, under an exceedingly wise legislative supervision. Improvements in the manner of burial are what he recommends, quoting the remarks of Mr. P. H. Holland, that dry open soils are the best, and that dense clay soils are in all respects undesirable.

In recognising the necessity for the registration of all diseases, our author would yet confine the registration, at present, to epidemic diseases. "When we look round at the progress which has been made towards the perfect comprehension of these disorders, we see no system as yet developed or developing that promises anything like a successful attainment of objects as beneficent as they are great. The majority of observers, indifferent as to the causes of disease, are content to rest their exertions on the remedial department of their art,—in curing those conditions which ought never to have been permitted."

It is well that physicians have come to see what we in the *Builder* and orally have said for the last quarter of a century,—that for the health of the people we want more than medicine; we want the prevention of that generally low state of health which disqualifies men for doing a good day's work without distress; for enjoying their meals, their pleasures, their night's rest; and, in short, their life as a whole. Who has not observed the makeshift way in which men do their work,—say in the building trades?—how they shuffle over it, and seem to have no pride or pleasure in it, in progress or when done. The disqualification we mean is caused in many instances by over-drinking; but besides that, another cause is the wretched homes in which the working population live; the unclean water which alone they can procure; the bad air they breathe; and, as a consequence of all these, the miserable condition of everything around them at home. We are not of those who would hold out to working men delusive hopes of being taken care of. Rather we have continually held that without their own honest endeavours, industry, and sobriety, all legislation on their behalf must fail, but we recognise their right to have such laws enacted as shall ensure the possibility of living healthily in the community of men.

Whether justice is done them in that respect we do not ask of any one, for we know it is not. Nevertheless, we say to working men, have patience, abide your time and live soberly, without anger, and then you may hope to see the day when you can live cleanly and healthily.

That some men will not live healthily though they have room enough for health; have good water and plenty of it for every purpose of health; and have good air all day and all night, is so; but for those who would, if they could, live healthily, it is necessary that these things be provided; and they cannot be provided by individuals. Those who speak from mere impulse might say of a working man living in a town and receiving good wages,—why does he not, as the first thing to do upon receiving good wages, improve his house? We must go a long way back to find the reason why he does not. He has probably been brought up in immorality and learnt his vices young; his father and his forefathers, as well as himself, have lived under no proper authority while they were young; freedom has naturally degenerated into licence, and the idea has become inborn in the people that no authority is to be tolerated. That might be proper to the occasion if we were prepared to admit that we are degenerating in wisdom, and that the faculty of hope is departing from us, along with faith and charity.

* A Ministry of Health and other Addresses. By Benjamin Ward Richardson, M.D., F.R.S. London: Chatto & Windus. 1879.

IMPROVEMENTS IN GLASGOW, AND THE CITY IMPROVEMENT ACTS.

ORIGIN OF THE ARTISANS' DWELLINGS ACT.*

IT will be generally admitted that if we would seek to elevate the great mass of our industrial population in our large cities throughout the kingdom, we must endeavour to provide them with comfortable dwellings. If the home of the working man be cheerless, dark, and unwholesome, the result will naturally be to drive him to the use of intoxicating liquors, and too often to the public house. A strong feeling of this has long existed in Scotland, and with the view of furthering it, movements have been made both in Edinburgh and Glasgow, especially so in the latter, and the movements, although somewhat retarded by the two often injudicious conduct of the workmen themselves, with their strikes and trade unions, have been attended, as I hope to show, with beneficial results. Every stranger who visits Scotland must be struck with the difference existing between the dwellings of the humbler classes in Scotland as compared with those in England. In England they generally reside in self-contained brick buildings, whereas in Scotland they almost entirely live in large stone tenements divided into separate flats, with more than one family on each flat. But a still more striking contrast consists in the fact that a large number reside in narrow lanes or closes in the older parts of the principal towns in Scotland, and although many of these lanes have been removed, there are still a considerable number inhabited by this class of the population. The old style of building was to erect large stone tenements fronting the street, with gardens behind, but as population increased large blocks of houses came to be built on the site of these gardens, and stretching back as far as from 200 ft. to 280 ft. Dividing these high tenements were narrow passages, or closes of from 3 ft. to 4 ft. wide. This system of building long prevailed throughout the large towns of Scotland.

In a work published in 1736 giving a history of Glasgow, the author, Mr. McUre, after enumerating the eleven streets which then constituted the entire town, compares it to a comb with teeth on each side, the streets forming the centre or wood of the comb, and the teeth on each side representing the narrow lanes or closes. Maps published in 1776 and 1800 show that in the part of the city then built (and when the population amounted only to about forty thousand) this system then prevailed. On looking into this one is tempted to inquire what could be the reason which induced parties, when ground was comparatively cheap, to resort to such a style of building. In all probability it was resorted to for protection during the troublous times which so long existed in Scotland, when families lived in masses to guard themselves from the raids of hostile clans or the oppression of the feudal barons. The early history of Glasgow is interesting. Originally it was a bishopric founded by David I. in 1120, who built a magnificent cathedral, and richly endowed it. Houses gradually clustered around it; a university was founded in 1450, when the population amounted to 1,500. As population increased ground rose in value, and builders, taking advantage of the old system, and being without any Building Act to prevent them, filled up almost every inch of available ground in the centre of the city. The houses in these closes and lanes were long occupied by respectable people, but gradually deteriorated, and particularly so from and after 1847, by an influx of population from the rural districts of Ireland, bringing with them habits which, however, innocuous among the open bogs of Ireland, were quite unsuited to the densely crowded parts of a large city. This class took possession of the closes, and greatly increased the overcrowding.

* By Sir James Watson. Read before the Royal Institute of British Architects, on Monday evening last, as elsewhere mentioned.

In some of these closes from 600 to 800 people came to be huddled together.

In 1866, when the Improvement Act passed, the density of the population in some parts of the city amounted in some cases to 600, and in others to about 1,000 per acre. The state of things may easily be conceived under such circumstances. The houses in these closes were generally old, dark, and ill-ventilated, without sufficient breathing space, and without family accommodation, there being only one ash-pit, &c., to each close,—sometimes even for two closes; and when fever or small-pox broke out, the results were appalling. The moral effect produced was not less disastrous. Many of the criminal classes took up their abode in them, driving away the more respectable. Scenes of riot and disorder, assault and robbery with violence, were of frequent occurrence, and in several cases murders were committed.

Such was the state of Glasgow when the Corporation, instigated by Mr. Blackie, then Lord Provost of the city, and Mr. Carrick, the city architect, formed the design of applying to Parliament for power to purchase and pull down whole blocks of these buildings, to sweep away these narrow closes, to open streets through the most densely-populated portions of the city, and to see that in lieu of these old and wretched houses, buildings should be erected, and vacant spaces arranged for, so as suitably to provide for the growing wants of the city. Plans were made, with the necessary books of reference for the streets to be re-formed and buildings to be taken down, and to every house scheduled notices were given, and an Act of Parliament applied for. The area of overbuilt ground thus scheduled extended to eighty-eight acres, being nearly the whole of the old town shown in the map of 1800. The plans showed the formation of forty-five new streets or enlarged thoroughfares. Powers were sought to expend 1,250,000*l.* on the purchase of these, and to take down, rebuild, or sell, in conformity with the plans of the new streets or enlarged thoroughfares. Powers were also sought to borrow money on security of the buildings, and to impose a tax on the rental of the city (to be paid by occupiers) of 6d. per pound for five years, and 3d. per pound for ten years. The Act passed almost without opposition in the session of 1866. Immediately thereafter a committee was appointed, over which I presided for the following six years. A tax of 6d. per pound was imposed for the first year, and a bank credit for 45,000*l.* was arranged for until the tax was collected and money borrowed on security of the trust. A judicious person (Mr. Lamb) was appointed to negotiate for the purchase of property privately, and as most of the buildings were old and dilapidated, and the owners willing to dispose of them, the committee succeeded in securing a considerable amount of property at very moderate rates. By the end of the first year they found themselves in possession of property to the extent of 50,512*l.*, obtained at from ten to fourteen years' purchase for dwellings, and eighteen to twenty years' purchase for shops. By this time loans began to come in freely at four per cent. The 6d. tax, which had raised a great amount of dissatisfaction and grumbling, was reduced to 4d. for the second year, at which it continued for four years. The purchasing went on, and by the end of the second year a large amount of property had been secured. Such owners of property as were willing to deal at moderate prices had their property purchased, while those whose demands were exorbitant were left over. A rule was laid down that no great improvement should be begun in any one place which would enhance the value of the adjacent property, until the whole buildings required for such improvement were purchased, and the adherence to this rule has tended much to the success of the enterprise. For the first two years nothing farther was attempted than putting the dwellings into a fair state of repair, and opening up some of the long closes by the removal of a portion of the back buildings, so as to secure sufficient breathing space, and playground for the children. The pressure of the 6d., and afterwards of the 4d., tax, without the necessary changes being seen, gave rise to a regular crusade against the committee. We were represented as ruining the city, and told that the sooner our operations were stopped the better. At our quarterly meeting, however, we were enabled to explain everything, and the good sense of the public ultimately prevailed. The proceedings of the committee were narrowly watched by builders, and when they understood that large clearances were about to be made, and remembered how little had been done for years in the erection of workmen's houses, they immediately commenced operations. The rage for building workmen's houses went on from year to year, whole streets of new houses sprang up, until the supply exceeded the demand. The committee, at first fearing that sufficient house accommodation might not be found for the displaced population, purchased two large lots of building ground in the vicinity, costing, including sewering and laying out of streets and squares, 80,661*l.*, to give off to builders for erecting workmen's houses at moderate rates. The plan succeeded, and resulted in a profit of 15,000*l.*

In about two years after the passing of the Act, commenced the demolition of some of the old and dilapidated buildings which had been purchased, such tenements as were dens of fever and disease, and haunts of the criminal classes, being taken down at once. This demolition process, however, required to be gradual, as it was necessary to prove to the sheriff before ejecting more than 500 persons of the labouring class that an equal amount of house accommodation suitable for such class existed or had been otherwise provided. In this, however, there was no difficulty, as the erection by private enterprise of the new went on much faster than the demolition of the old. The clearance thus effected by the committee, aided as it was by certain railway operations requiring similar treatment, had soon a marked effect on the health of the inhabitants, and particularly on that of the children, whereby the mortality, particularly of the latter, was considerably lessened.

For the first four years the attention of the committee was chiefly occupied with the purchase of property and removals already alluded to. The rest of the property was put into a sufficient state of repair and let so as to secure a proper income. By 1870 the property secured amounted in value to 735,000*l.*, and the money expended to 764,063*l.*, and in 1871, 931,231*l.* In 1871 the Act was extended five years, and in the same year the chief constable reports as follows:—"Through the operations of the City Improvement and the Union Railway, the city has been cleared of the foulest dens of profligacy and crime, and their occupants scattered among a population breathing a purer atmosphere, thereby affording facilities to the police for bringing the vicious to justice more easily and certainly than when the whole formed a concentrated and combined colony of ruffianism."* Fears were at one time entertained that the dispersion of the low class to other parts of the city might contaminate those places, but these fears were found to be groundless. On the contrary, our sanitary inspectors have repeatedly reported that the condition of the displaced population has been improved, and that although paying higher rates for better houses in other districts, they are satisfied of the advantages of the change.

About this period, 1871, the improvements began to be carried out by the sale of the ground with its buildings in order to carry out the plans laid down by the city architect. Care was taken not to put much in the market at one time, and the prices exceeded their expectations. In all cases the ground has been disposed of by public sale. The result of the committee's proceedings to the present time may be enumerated as follows:—

	Property Bought and Paid for.	Ground Sold.
In 1872 ...	£985,159	... £124,307
„ 1873 ...	1,087,365	... 180,762
„ 1874 ...	1,241,353	... 513,112
„ 1875 ...	1,315,008	... 565,136
„ 1876 ...	1,431,593	... 774,091
„ 1877 ...	1,487,362	... 883,634
„ 1878 ...	1,538,971	... 921,538

The property has been all acquired by private negotiation with the exception of three jury trials. The result of the operations has been to reconstruct large portions of the city. Wide and handsome streets with spacious shops and dwellings have in many cases taken the place of narrow streets, and lanes of old and dilapidated buildings. Narrow closes, whence the criminal classes were wont to issue nightly in quest of prey, are now all but unknown, and respectable dwellings and warehouse premises have taken their place. Fever dens have been removed, and by aid of the Sanitary Committee the death-rate in these districts has been greatly reduced. The death-rate, which was on an average 29 in 1,000 in 1866, was reduced to 25 per 1,000 in 1876, a saving of life in a population of 500,000 equal to 2,000 annually. Last year the average was 26 per 1,000, notwithstanding the unusually severe weather during the last months of the year. There are still, however, portions of the city requiring reconstruction, which are being attended to by the Commissioners.

It is difficult to give an adequate idea of the change produced in the various parts of the city by these operations. It is proper to mention that ground in the centre of the city was found to be too high in price to allow of the erection of workmen's houses. The buildings, therefore, which were erected there on the site of those pulled down, have consisted chiefly of shops and warehouses, along with dwellings for the middle classes. Those built for the working class have been erected at some distance from the centre of the city, where the sites were less costly.

The following letter, which I have received from Mr. White, our assistant master of works, will explain the average specimen of the class of workmen's houses lately erected:—

"24th March, 1879.

Sir James Watson, St. Vincent-street.

Dear Sir,—I send herewith two tracings. Plate 8 is the plan of building erected by the magistrates and council in Warwick-street, which is 60 ft. in width. It consists of four flats, each flat having two separate dwellings of two apartments and scullery. The arrangement is one of the best that exists; the apartments are large, the ceilings of good height, viz., 10 ft., and the height of the building 45 ft. 6 in. The free space requisite in three-fourths of this height; actually it is much greater, as the plan shows.

Plate 9 is the plan of building erected in Dalmarnock-road, a street of 80 ft. in width. The ground flat is occupied by two shops, each of which has at the back an apartment which may be used as a dwelling. The three upper flats have three separate family dwellings on each flat, two of them having two apartments, and the centre one one apartment. The single apartment I do not approve of, my opinion being that there should be no separate dwelling of only one apartment. The height of the building is 45 ft., the ground flat having a height of 12 ft., the others of 10 ft. The free space necessary, in accordance with the Police Act, is three-fourths of the height.

Notwithstanding the great care taken by the Court in examining plans to see that the arrangements for dwelling-houses are as complete as possible, in some instances it is rendered unavailing on account of houses, consisting of three and four or more apartments, and which, when the plans passed the court, were shown as and intended to be occupied as one dwelling, being converted into single apartments. If the proprietors were bound to make application to the Court, it would not allow such alterations without sufficient means of ventilation being provided.

I am, your obedient Servant,

John White."

It may be proper here to mention that, by a clause in the Glasgow Police Act, obtained in 1866, no building in which there are sleeping apartments is permitted to be erected, unless there be a free space in front of the window equal to at least three-fourths of the height of the wall in which it is placed. In streets formed since the passing of the Act, the width of the street must be equal to the height of the building. Where there are no sleeping apartments, it is in the discretion of the Court to allow the building to be higher than the width of the street by one-fourth. In the old streets, however, formed previously to the passing of the Act, there is no such restriction as the width of the street regulating the height of the building. The consequence is that large tenements in which there are no sleeping apartments have been erected in several of our narrow streets, thereby excluding to a large extent the sunshine, air, and light of heaven.

The restriction as to the free space in front of and behind all buildings in which there are sleeping apartments, amounts on an average to about 30 ft. of open ground. As far as the space in front of the building is concerned, it is well adhered to; but as regards the space behind, the Act is frequently evaded by parties who are proprietors on both sides of a square erecting tenements with a space of 30 ft. between the buildings in place of 60 ft., which would be required if the buildings belonged to different parties. Thus the 30 ft. is made to do double duty. This is felt to be particularly objectionable as regards what are called hollow squares, where, as they are closed on all sides, there is a total want of air circulation.

A very salutary regulation was introduced into the Police Act, requiring all apartments to be of such a size as to admit a certain amount of cubic feet of open space. The words of the Act

* Between the years 1867 and 1873 there is a diminution in the total cases of crime annually reported of 3,030. Total cases reported to the police in 1867, 10,899; in 1873, 7,869—difference, 3,030; and this in face of an increase of population of 57,483. Since then the numbers have fluctuated, but any increase is slight taking into account the increase in population.

are as follow, showing the difference in regard to houses built previously to the passing of the Act, and those built subsequently :—

"If such dwelling-house consists of one apartment, and was used as a separate dwelling previous to the passing of the Act, unless it contains at least 700 cubic feet of space, or, if it was not so used, unless it contains at least 900 cubic feet of space.

If such dwelling consists of only two apartments, and was used as separate dwelling previous to the passing of the Act, unless it contains at least 1,200 cubic feet of space, or, if it was not so used, unless it contains at least 1,500 cubic feet of space.

If such dwelling consists of only three apartments, and was used as a separate dwelling previous to the passing of the Act, unless it contains at least 1,800 cubic feet of space, or, if it was not so used, unless it contains at least 20,000 cubic feet of space."

This is exclusive of closets, presses and recesses not exceeding 4 ft. in depth, and not having a separate window therein.

By a subsequent clause powers are given to persons appointed by the Board of Police from time to time to enter any dwelling-house which consists of not more than three apartments, for the purpose of measuring, in cubic feet, the space contained therein, and to mark, on or over the outside of the door of any such dwelling-house (if the cubic contents thereof do not exceed 2,000 ft.), or to affix thereto a ticket, on which are marked, in such position and style as the Board see fit, the number of such cubic feet, and the number of persons exceeding the age of eight years, who, without a breach of the provision after mentioned may sleep therein. This provision is, that when apartments are used for sleeping in by a greater number of persons than in the proportion of one person of the age of eight years or upwards for every 300 feet of space, or of one person of an age less than eight years for every 150 cubic feet of space contained therein, every person so using, or offering to be used, shall be liable to a penalty not exceeding 5s. a day during which it is so used.

For the enforcing of these regulations, a staff of sanitary inspectors is constantly employed; and, from the tickets placed on the doors, they are able to report all cases in which the requirements of the Act have not been complied with. The owners of the houses found offending are summoned before the police magistrate; are at first admonished and warned; and, if again found offending, a fine not exceeding 10s., or five days' imprisonment, is imposed.

The overcrowding which existed previously to the passing of this Act may be learned from the fact that, of 58,003 houses visited in 1866, the year the Act passed, no less than 4,948 were found overcrowded; and such at that time was the scarcity of workmen's houses, that the police were unable to carry out their regulations with effect. The number summoned that year, therefore, only included those of a very aggravated nature,—viz., 953. In 1847, the superintendent of police reported in regard to the numbers living in lodging-houses of a low class, that were he strictly to enforce the Lodging-House Regulations, he would turn out 6,000 persons nightly to the streets. Since the Improvement Act came into operation, however, with the erection of whole streets of houses for the working classes, it will be seen by the following figures how greatly and gradually this overcrowding has decreased, although from the nature of the population it will always to a certain extent exist.

From 1871, the cases brought before the Police-court for overcrowding, after the magistrates began strictly to enforce the regulations, were :—

1871	3,143	1875	1,623
1872	1,741	1876	1,446
1873	1,162	1877	1,247
1874	1,540	1878	1,141

Thus, in 1878, a year of great poverty and want of employment, the cases were not much more than a third of what they were in 1871. So much, I think, for the effect of the Improvement Act on overcrowding.

The Dean of Guild Court, to which everything connected with the erection and superintendence of buildings and formation of streets is referred, consists of the Dean of Guild as president of the Guildry or Merchantmen, along with three master-tradesmen sent by the Trades House, three merchants from the Merchants' House, the Master of Works for the City, the Fiscal or Public Prosecutor, and a legal Assessor. No building can be erected until the plans are submitted, examined, and sanctioned by this Court; and all alterations affecting the exterior of any building must also, before being executed, pass this Court. A supervision is kept over all buildings in course of erection, and when buildings become dangerous they are required by the Court either to be rendered safe or taken down. The decision of the Court can only be appealed to the Court of Session; and such is the care taken in these decisions, that very few are ever appealed. This Court has proved of the greatest service to the community.

It is evident that no lasting benefit can be derived from Improvement Acts, unless care be taken by sufficient building regulations to prevent the recurrence of such evils as these Acts are intended to remedy. In vain need we spend money to lessen the density of the population, if builders are to be allowed to place erections on every available inch of ground; and in vain do we seek to improve the health and comfort and morality of the people unless we secure for them a free circulation of light and air. The effect arising from the want of such regulations is shown by the present state of the City of New York, in which it is stated that 500,000 people—nearly half the population of the city—are crushed into a density about double that of the most thickly-populated districts of London. It is calculated that in that same city of New York there are 125,000 children under five years of age, only one in ten of which reach the age of maturity, and where nearly all the criminals that infest the city have now congregated.

We come now to inquire at what cost this has been effected. In a careful estimate made up by me with the aid of Mr. Morrison, now the intelligent and able chairman of the committee, and Mr. Nicol, the City accountant, we made out the whole cost of these improvements at 31st May, 1877, to amount to 178,462*l.*, arising from waste rents, interest of ground for a time unbuilt before being sold, Parliamentary expenses, and expense of management. The result was made up as follows, viz. :—

Ground sold and on hand as valued.....	£1,647,332
Ground sold and paid for	1,612,504
Difference.....	£34,828

So that these pay for themselves. There have been,—

Taxes raised	£283,462	
Taxes to be raised at 2d. per pound.....	80,000	
		£363,462
Deduct price of a public park.....	40,000	
Ground thrown into streets and open spaces, valued at	100,000	
Paving streets and construction of sewers	65,000	
		205,000
Loss..		£158,462
Contingencies ...		20,000
The whole charge to the city.....		£178,462

On consulting with our city architect as to the operations of the Trust since this estimate was made up, I find he considers that the present state of the Trust, if estimated, at present will still come very near what I have stated.

The last point to which I would allude is the manner in which the displaced population has been provided for. It has been shown by the chairman, Mr. Morrison, that during the first ten years after passing the Act, say until the middle of the year 1877,—

The population displaced was		28,965
Add natural increase of population requiring accommodation, say 9,000 annually for ten years		90,000
		118,965
To meet this there have been provided within the municipality.....	202,302	
Outside the municipality and within half-a-mile radius of the city, accommodation for at least.....	100,000	
		302,302
		183,337

Showing that the supply is in excess of the demand by nearly 200,000. While this provided for all who were able to pay a moderate rent, it entailed considerable hardship on a class belonging to a lower stratum who lived in small houses and rented at 2*l.* 10*s.* to 3*l.* per annum: such as widows with young children, old and infirm persons earning small wages, hawkers and single women, having the old Scotch independent spirit that they would rather starve than go into a workhouse. Accommodation has been found for these, viz. :—

First.—By a number of tradesmen vacating their old and removing into the newly-built houses.

Secondly.—By converting large dwellings in the older parts of the city into single and double apartments.

Thirdly.—By the erection of model lodging-houses, where parties unable to keep a house are provided with lodging, including fire, gas, and cooking utensils, at 3½d. per night, or 1*s.* 9*d.* per week,—Sunday gratis,—thus enabling them to live with more security and in a better atmosphere than in their old domiciles. As yet there has been no case of infectious disease.

There are now five of these houses belonging to the Trust, and two more in course of erection. Cost of the whole estimated at 80,000*l.* They are all well frequented, and are self-supporting.

The proceedings I have described attracted the notice of Mr. Cross, the Home Secretary, who requested information as to details. He afterwards visited the scene of these operations, and as the result brought in and passed the Artisans' Dwellings Bill, which promises if taken advantage of to be of great value to our large cities. It is deeply to be regretted, however, that so very few of them have as yet done so, although in many the reforms to which I have alluded are loudly called for. It is not for me to individualise these, but they must be known to many of the members of this Institute. The first that stands out prominently, as shown by Mr. McCullagh Torrens in an able article in "Macmillan's Magazine" for this month, is the City of London. In this article, after alluding to the frightful state of several districts, he points out with great force the necessity of restoring the Act of 1868 for the pulling down of old houses, &c., to what it was as passed by the Commons, whereby power was to be given to municipal authorities to compensate the owner for the fair value under the Land Clauses Act, and to build workmen's dwellings with money borrowed at 4 per cent., charging it for a time upon the rates. This, however, should by no means supersede the putting in force of the Artisans' Dwellings Act. Much is being done to educate the people, but I can conceive nothing more likely to frustrate such exertions than to have large masses driven into wretched dens and hovels from which an *émeute* in times of bad trade or political disaffection might be attended with serious consequences.*

INSTITUTE OF PAINTERS IN WATER COLOURS.

WE have been a little disappointed the last year or two with the works of Mr. Linton contributed to this exhibition, as compared with what we had become accustomed to from his hand. There was always the same fine colour and broad style; but some of his recent works have wanted the intellectual interest which had so exceptionally characterised many of those of previous years. Any one regarding his two drawings in the present exhibition, which opened this week, will admit that he has fully compensated us this year. One of these represents one of the first adventures of Gil Blas, when he was cajoled into giving a supper to an impudent adventurer at the inn, much in the same kind of way that the vicar was taken in by Mr. Ephraim Jenkinson's admiration of his genius. The humour of the scene is perfectly given. On the one side the expectant guest advances bowing low, partly in mock homage, partly to hide his irresistible inclination to laugh. He is a regular bravo, of the style now surviving only on the stage, in red cloak, and girt with a long rapier. Gil Blas, seated at table, facing the spectator, listens open-mouthed, with his hands, holding the knife and fork upright, resting on the table wide apart, as if he had been impelled to pause in the very act of attacking his meal. His face is expressive of bewilderment and a certain degree of alarm. He has hardly yet begun to swallow the extravagant compliments of the other seriously. A little behind him stands the landlord, with his hand over his mouth, to choke his own laughter. The figures completely represent the humour of Le Sage; and not less delightful in its way is the painting of the collection of miscellaneous objects in the foreground, among which a large brass kettle is predominant: there is possibly too much of a picturesque litter, even for a Spanish tavern of

* The Number of the Transactions of the Institute containing this paper includes a large number of illustrations and can be obtained at small cost.

the period. The other work is tragic in its aim: it is entitled "False" (138), and includes two figures only,—a very disagreeable-looking man in red velvet costume, who is leaving contemptuously a woman who is seated on the left, her head bowed in her hands in the deepest despair. The figure of the woman is one of the finest and most pathetic things we have seen for a long time; there is expression even in the dress, which falls in grand sculpturesque lines and masses. As mere pieces of painting, these two works are of the highest class, but what makes their value is, that after we have given all appreciation to the manipulation, we still find the highest interest of the work is beyond all that, and lies in its intellectual force and feeling. It is a curious comment on the prosaic and realistic character of English art at present, that we should have to mention this superiority of intellect over mere execution as exceptional; but so it is. Perhaps it is a still more curious phenomenon to find placed on the line on the same wall such a work as "Jehu on his way to Jezreel." At this rate, exhibitions can hardly be supposed to have much educational influence in teaching a benighted public what is or is not high art.

One of the most ambitious contributions is Mr. C. Green's "Bartholomew Fair" (132), a highly-finished work crowded with small figures, displaying great variety of character, the best group of the whole being that of the thimble-rig man and his victim. The scene is in front of a set of booths, two of them theatrical, whose companies are just parading themselves in front before the commencement of the performance. These two groups of "poor players" in the background are among the cleverest parts of the work, especially the troupe who are dressed for *Hamlet*. The painting (for it is hardly a water-colour drawing in the true sense) is more pleasing in detail than as a whole; the general effect is rather hard and spotty, and there is a want of light and atmosphere; everything has been sacrificed to minuteness and multiplicity of detail. Mr. Towneley Green's small work, "The Reckoning" (47), has higher qualities, though meaning much less; in fact, the "motive" of the picture is one that has been worked threadbare; the artist has so chosen his period as to afford him scope for a great deal of fine colour in the costumes of the party, and has succeeded in contrasting very well the mere business manner of the young woman who waits for the amount with the easy enjoyment of the young gallants who form the company. There is also some minutely delicate painting of detail in the table accessories. Altogether this is a thoroughly pleasing work, slight as its aim may be. Miss Mary L. Gow strikes a higher key in her "Vittoria Colonna" (152), an inspiration caught, we should say, from Mr. Linton; there is want of intelligible motive or incident in it, however, so much so as almost to make one think it was painted merely as a study, and named afterwards. Mr. Carrick's figure-subjects all have good qualities, but are not equal to what he has done. Mrs. Elizabeth Murray sends again some very clever Eastern figure sketches; and Lady Lindsay, of Balcarres, a pleasing head, entitled "A Wintry Morning."

In landscape Mr. Aumonier and Mr. Orrock are pre-eminent. "Southwold, Suffolk" (21), by the former artist, is a noble work, worthy of some of the best names in that French school of landscape art to which it is so much allied in feeling. Mr. Orrock sends a good many drawings larger and more ambitious than he has usually contributed; he perhaps a little too much repeats an effect of wet and mistiness which he has made his own, but there is an eminently out-door and open-air impression produced by his works, which are full of real wind and rain, and make one wish for a waterproof. Mr. Hine is, of course, not to be overlooked, but he has hardly been at his best in this exhibition; the "Autumn Evening on the South Downs" (27) is a fine work, less carefully executed than is usual with the artist. Mr. Collier, whose landscapes have been among the chief attractions of the Institute for some years past, has also been less successful than usual in his large work "Wide Pastures" (38), chiefly, it seems to us, through carrying a little too far the broad and free style of handling which he had made such successes with before. Breadth may be carried too far; we like to be able (at the proper distance, of course), at all events, to see what each blot of colour is meant to convey, which we do not quite seem to see in this work, though it would pass as a very fine and free sketch. Mr. Syer's works are in his best way; he is as broad (or rough) as Mr. Collier, but he chooses subjects which can be fully portrayed in this manner. Mr. Hargitt's "The Tay from Kinnoul Hill" (129) belongs in comparison to a rather matter-of-fact school of art, but the treatment of the river winding over the middle distance is fine, full of light and transparency, and giving a great idea of extent. Mr. Wimperis, another admirable artist, seems again inclined to "rough it" a little too much in such a drawing as "On the Glaslyn" (141). There is a rather large proportion of architectural subjects, some very brilliant, hard, and highly finished, as architectural representations very complete, but that is not what we look for so much in a general water-colour exhibition. Among smaller works of architectural interest we may notice Mr. Hargitt's "Ruins of Sardis" (161), Mr. L. J. Wood's "Rothenburg on the Tauber" (163), and Mr. Hine's little drawing of "Hove Church, near Brighton, before Restoration" (137), which the Society for the Protection of Ancient Buildings should purchase.

These and a few other works make the exhibition, which as far as its best works go is a very interesting one; but these are embedded in a mass of mere "drawing-master's" work which it is painful to contemplate, and which seems to become more pronounced and more vulgar every year. If the Society could weed out about half (not to say two-thirds) of their regular contributors, they would have much finer exhibitions,—"fit, though few." But we suppose walls must be covered.

THE RECENT EXCAVATIONS AT THE COLOSSEUM.

FROM day to day our acquaintance with the still unfathomed mysteries of life in classic Rome progresses.

For some years past we have been constantly receiving notices from Rome of new investigations, which invariably lead to interesting results. Such, indeed, have been the discoveries made within the last generation that the poet of the future (who still seems to rest in embryo) will find in the Eternal City for the exercise of his imagination a very different Rome from that which inspired Goethe and Byron in years gone by, when the classic capital still lay half buried, and when its treasures, if suspected, still rested, covered by the *débris* of ages.

Of all the monuments of the classic days of Rome, certainly the most familiar to the world, through innumerable pictured representations, and literary and antiquarian descriptions, may be said to be the Colosseum; yet, strange to say, it has remained almost the last of the Roman remains to attract the active research of the archæologists. Till only a few years ago the grand old ruin stood just as the neglect of the early Christian and the Dark Ages, together with the spoliation of the Mediæval barons, had left it, save for those portions of restoration which a few popes had somewhat ostentatiously ordered; the whole rendered additionally beautiful by a rich covering of almost untouched vegetation, so special in its character that a charming and exhaustive work, the "Flora of the Colosseum,"—a work that should be, if it is not, known to all botanists,—was written some years ago by the once favourite English practitioner at Rome, Dr. Deakin.

Once again the attentions of archæologists have been bestowed on the Colosseum, and now, somewhat cruelly perhaps, we find how generation after generation of the strangers who have visited Rome since the great days of the classic revival down to within a few years have lavished their fancy on a building, with the original conditions and arrangements of which they believed they were completely acquainted, but of which in reality they were woefully ignorant.

Through what vicissitudes the Flavian Amphitheatre passed, after having served for the struggles of the gladiators and of wild beasts, and the naumachiæ so dear to the Romans, till the year 523 after the Christian era; after having been, in the ferocious days of the Middle Ages, the stronghold of the Frangipani and the Annibaldi; after having been the scene of many a tournament of gallant and plumed knights at the period of the first Renaissance; after having served as a stone-quarry for several centuries, and produced to the world, among many other children, three lovely daughters,—the Palazzo di Venezia that of the Cancelleria, and the Farnese, which, grandiose as they are, seem but pigmies in comparison with their parent; after Leo X. placed so stout a prohibition on this Vandalism; after having been almost sanctified by that pontiff in memory of the martyrs of the Christian faith, who redeemed with their blood the dust of the arena, first termed "the Colosseum" in the eighth century by our own English chronicler, the Venerable Bede; after having seen Viæ Crucis innumerable, popular committees, pontifical Zouaves, and Italian lancers bivouacked beneath its picturesque arcades; after having fed for centuries the romantic imagination of the poets and writers of every civilised country of the world; how, after so many adventures and vicissitudes this huge monument of Roman splendour has become, until quite recently, an almost undisturbed pond, the home of the frogs, is no dificult story to tell, for it has been so, since the close of 1875 and the commencement of 1876, when a series of excavations, to verify and investigate the construction of the foundations and the underground works of the edifice, was first determined on. Archæologists have not a little of that mania of the child which wishes to know what is in its toy-drum or bran-stuffed doll. Were an antique Roman to come to life by chance, as young and as handsome as if 1,850 years had passed over him in a flash, the archæologists (have we not Edgar Poe's word for it in the case of his thrilling story of the mummy?) would not be content merely with examining him exteriorily, but would certainly wish to pull him to pieces, to see how he was made inside.

This said, be it remembered, with all due respect to so important a science as that of the antiquary,—especially also with all the respect due to that portion of the profession who have shewn such an interest in the classic topography of Rome, a study which has now given rise to a regular course of lectures at the University of Rome, delivered by Professor Rodolfo Lanciani, a highly-esteemed contributor to the *Bolletino Archæologico Municipale*,—the fact still remains that since the date to which we have already made reference not a little difficulty has arisen in the progress of the excavations, which have had, to the eyes of the profane at least, but one, and that by no means a satisfactory, result,—of seeing the whole floor of the Colosseum upset, and those portions excavated filled with water and peopled with noisy frogs, a result of evidently little service to science, which has already made these much-abused reptiles a subject of prolonged research.

In some manner or other this unexpected inconvenience had to be obviated. To get rid of the water by means of pumping-machines was impossible, as the more the water was pumped out the more it entered, a result which pointed evidently to the existence of underground communications between the amphitheatre and the Tiber. Many documents tended to prove this belief; the only difficulty lay in the discovery of their position. It has been in search of these subterranean canals that the engineer Narducci has passed three years, and expended no less than 12,000*l.* to 14,000*l.* sterling.

On the morning of the 3rd of March last, in the presence of the Minister Coppino, the Senator Fiorelli, the director-general of the excavations, Professor Rodolfo Lanciani, the topographer of classic Rome, and Duke Leopold Torlonia, the waters of the Colosseum were admitted by a small canal from the basin, into the antique and now renovated sewer, and so into the new drain-pipe which runs from the Arch of Titus to the Tiber, a distance of 1,192 linear mètres, or some 1,300 yards.

In the little house of the neighbouring *Orto Botanico*,—so called because it is a garden and not an *orto*, and, in addition, possesses no character that is particularly botanical,—were exhibited on the same morning a number of plans, elevations, and sections, executed with the utmost care by the engineer Narducci, and especially important from an archæological point of view. In excavating over a large space several yards beneath the existing surface of this part of the city, which was the centre of classic Rome, Signor Narducci has made a number of discoveries worthy the attention of all students interested in the history and life of the city when it was literally the capital of the world.

From these investigations, and from the relation of them made by Signor Narducci himself, we gain the following interesting facts:—

That as far back as the time of Tarquinius

Priscus there existed leaden conduits for the supply of drinking-water to the city. This was some 600 years before the Christian era, and strikingly proves the accuracy of those classic authorities who tell us how this monarch (the fifth of the kings of Rome) "laid,"—we cannot do better than quote the always valuable words of Lemprière,—"the foundations of the Capitol, and to the industry and to the public spirit of whom the Romans were indebted for their aqueducts and subterraneous sewers, which supplied the city with fresh and wholesome water, and removed all filth and ordure, which in a great capital too often breed pestilence and disease."

From the investigations made, it appears that from the epoch of the kings there existed in Rome a regular system of drains for the off-flow of the sewage and water, while,—strange contrast in this year of grace 1879,—modern Rome possesses no system whatever of drains, an inconvenience of the existence of which the eyes as well as the nose too often testify.

Further, we now learn that the system of *cloacæ* in the time of the kings was injured and interrupted by later constructions, often carried out at the caprice of the emperors, so that the water collecting in this low-lying portion of the city, and especially in the Colosseum, rendered the spot unhealthy till the days of Nero in the early years of the Christian era.

It is also proved now that the streets of the city were at the time of the kings, say 600 years before Christ, at a level nearly 30 ft. below the existing surface; also that the road along which passed the uncovered conduit was cut when the Circus Maximus and the Cloaca Maxima were constructed, commenced 599 B.C., and terminated eighty years after.

As for the off-flow of the Flavian Amphitheatre, it was arranged by a series of drains communicating with each other and entering those *cloacæ* or sewers destined to collect and carry away the water from the subterraneous parts of the amphitheatre, in the direction of the major axis of which they were placed.

The new works have, as it may be imagined, led to considerable outlay, but their importance is not alone archæological, but hygienic. The neighbourhood of the Colosseum, although no longer a marsh as in days gone by, has had the reputation of not being too healthy. The waters which stagnated there until a few days ago could scarcely be expected to produce beneficent exhalations. But now there is no longer any fear, and the chief cause of the unhealthiness got rid of, the effects will cease.

It is to be hoped, also, that the attention of the engineers will be turned to the levelling and rectification of the floor of the arena, so that, in the silence of the starlight nights, young romantic couples or musing poets may ramble over the old building as in times gone by, without danger of suddenly finding themselves at the bottom of some of the deep and now uncovered drains, and thus being unwittingly called upon to verify personally the solidity and durability of the construction of eighteen hundred years ago.

With the Colosseum thoroughly investigated, and many of those numerous points of doubt which have long disturbed the minds of the antiquary and the inquiring classical scholar cleared up, it will require even less than in the past the imaginative mind of the poet to picture those terrible scenes in describing which Chateaubriand and Byron, among many other writers, have so moved our compassion. The Colosseum then, indeed, will be (what it in reality was not when the well-known line was penned),—

"A noble wreck in ruinous perfection."

Dublin.—On the 12th inst. the Duchess of Marlborough formally unveiled the Balfe memorial window in the southern aisle of St. Patrick's Cathedral, Dublin. The movement to erect the window was set on foot a few months ago to remove the reproach to Ireland that, although the composer had been dead more than seven years, there did not then exist in Dublin any monument whatever to testify to the world that Balfe was born in Ireland. In the Balfe memorial window the main portion is a figure of Erin placing a wreath of laurel on the head of Balfe. The left hand rests upon an ancient Irish harp. Beneath is a lyre. The window bears an inscription, testifying to its erection in memory of Balfe, by Robert P. Stewart Knight, Mus. Doc. The work has been executed by Messrs. Ballantine, of Edinburgh.

ANCIENT LOCKS AND KEYS.

WHETHER locks and keys ranked among the productions of Tubal Cain, "the inspired artificer in brass and iron," is not recorded in the annals of metallurgical antiquities; but it is an undoubted fact that the construction of these articles occupied some of the early disciples of the renowned metal-worker. In the Old Testament references to locks are numerous, particularly in the chapters relating to the rebuilding of Jerusalem by the prophet Nehemiah. The description of Solomon's Temple (1 Kings vi.) mentions "folding doors," which require locks of a special character, and which were doubtless made by "Hiram out of Tyre," who, we read, "was cunning to work all works in brass." In Solomon's Song reference is made to "the handles of the lock," and there are other allusions in various parts of the Sacred writings either to locks or keys, notably in Judges iii. and Isaiah xxii.

Some of the earliest classical writers favour us with more or less descriptive references. Aratus, for example, compares the constellation Cassiopeia to a key, the stars to the North composing "the curved part," and those to the South the "handle." The poet Ariston, in his "Anthologia," applies to a key a Greek epithet signifying "one that is much bent." Callimachus, in his "Hymn to Ceres," conveys the idea that the keys of that time were of giant size compared with those in modern use. Representing the goddess in the assumed form of Nicippe, he sings of her priestess carrying a key *superhumalem*, or "fit to be borne on the shoulder." One can hardly imagine, however, that the key used by the fair Penelope to open her wardrobe was of such huge dimensions. Homer (Odyssey, xxi.) tells us that was "a brass key, very crooked, and tipped with ivory." The passage is thus rendered by Pope:—

> "A brazen key she held, the handle turn'd,
> With steel and polish'd ivory adorn'd;
> The bolt, obedient to the silken string,
> Forsakes the staple as she pulls the ring;
> The wards respondent to the key turn round,
> The bars fly back, the flying valves resound;
> Loud as a bull makes hill and valley ring,
> So roar'd the lock when it released the spring."

If it be really true that Penelope's lock was so very noisy,—the first rude conception of the modern *alarum* lock,—the members of her household would doubtless have desired her visits to her wardrobe to be "few and far between."

The Egyptian lock, of which rude representations are found chiselled among the *bassi relievi* at Karnak and the Herculaneum, is at the least 4,000 years old. Its construction is simple, and it affords little or no security. Its principal feature consists of three pins, which being pushed into an equal number of cavities in the bolt hold it fast. A key on the outside releases the pins, which are of various lengths, to which, of course, the key is made to correspond. Egyptian locks were first introduced into Britain by the ancient Phœnician merchants, who traded in Cornish ores, and some specimens of these locks are to be found in Cornwall and Devon at the present day. It was doubtless this description of lock which is so frequently alluded to in the early English ballads and metrical romances, under the term "Thrilled upon the pin." The expression occurs in the poem "Glasgerion," the hero of which was a Celtic bard mentioned by Chaucer. Bishop Percy, in a foot-note to the poem, says "that thrilled upon the pin," "twirled the pin," and "tirled at the pin," seems to refer to "the turning round the button on the outside of a door, by which the latch rises, still used in cottages."

Locks and keys were manufactured in England before the time of Alfred. As early as the twelfth century English locks were elaborately ornamented, and this artistic feature of the locksmith's craft became more conspicuous from the fourteenth to the end of the sixteenth centuries. The handles of keys especially became greatly elaborated, being so entirely composed of scrolls and ornaments that they bore some resemblance to network. In the seventeenth century a cross was usually inserted in the keybow, a very common ornament at that period. Doubtless the English locksmiths of the time were stimulated by the example set them by their fellow-craftsmen on the Continent. The late Elihu Burritt says, "In the Middle Ages locks and keys exercised and disciplined the finest mechanical skill and artistic taste of various ingenious communities. They were not only elaborated for security, but for ornament, and nothing made in these modern days can approach these unique productions. Indeed, the artist in iron, steel, and brass set to work upon the lock and key for a city gate, cathedral or palace door, to connect the memory of his name with the edifice for ever, or as a Raffaelle would sit down to a 'Madonna' which should attract the reverent admiration of ages to come." A specimen of this Mediæval workmanship is now before us, in the shape of a *serrure de tabernacle*, manufactured in Gaul. The escutcheon surrounding the keyhole is surmounted by a representation of Our Saviour, and on either side are figures of guardian angels. The surface of the lock is elaborately engraved, the edges being lined with beads and scrolls.

The Chinese lock, dating almost from the days of Confucius, has "sliders or tumblers," and was originally made of wood. It was, in fact, a crude embodiment of the principle now known in connexion with the "lever lock," which affords the highest and best form of security.

Another lock of antiquity worthy of note is the "letter lock," or combination padlock. This lock is so constructed that the letters of the alphabet may, by pre-arrangement, be required to spell a certain word, or number of words, before it can be opened. Although apparently complex, the security in this lock is in reality very small, and the invention has long been regarded as more curious than useful. It is a Dutch invention, and is several centuries old. This lock is alluded to by some of the poets early in the seventeenth century, about which time they were probably introduced into England for securing the despatch-boxes of court couriers. In Beaumont & Fletcher's play of "The Noble Gentleman" (A.D. 1615), we find this couplet,—

> "A cap-case for your linen and your plate,
> With a strange lock that opens with A M E N."

And the poet Carew, in 1620, writes,—

> "As doth a lock
> That goes with letters, for till every one be known,
> The lock's as fast as if you had found none."

Among what may be called the "curiosities of industry," locks and keys are very fairly represented. It is related of Mark Scaliot, a smith who flourished in Elizabeth's time, that he constructed a lock "consisting of eleven pieces of iron, steel, and brass, all of which, with a pipe-key, weighed only two grains of gold." The inventive Marquis of Worcester designed a lock in which a steel barb was secreted, and so adjusted as to spring out and catch the hand of any one introducing any but the right key, "as," to quote his lordship, "a trap catches a fox." The construction of locks with secret ways of opening was a favourite occupation of some of the Continental monks during the Middle Ages. One sample of these articles was known as the "Apostle Lock,"—an elaborate affair, having in raised metal-work figures of the apostles, and connected with the hand of one of them was a secret spring, which, being pressed, caused the bolts of the lock to fly back.

As illustrating the extreme in the dimensions of locks, we may mention that at Willenhall,—the greatest English centre of the trade,—padlocks are made out of two threepenny-bits; and the leading firm there made for a fortress in Malta some years ago locks over 5 ft. in length, and weighing nearly half a hundredweight each! Leglocks and handcuffs are still unhappily in request; but the demand for locks for "iron bridles" and 'ducking-stools," once necessary for the chastisement of scolds, has, we are glad to learn, quite died out, and it may be hoped that the world is steadily, if slowly, progressing towards the time when, like Longfellow's model village of "Acadia," it may be said of the whole human family that,—

> "Neither locks had they to their doors nor bars to their windows;
> But their dwellings were open as day and the hearts of their owners."

The Public Works Loans Bill.—The Town Clerk of Birmingham is calling the attention of other municipalities to the provisions of the new Public Works Loans Bill, which affects all public bodies having occasion to borrow money. It proposes to limit the amount of loan to any single borrower to 100,000*l.* in one year, and to alter the mode of repayment by terminable annuity to a repayment of instalment with interest annually, which will raise the annual payments very considerably at the commencement of the period.

A CELEBRATED PRINTING-OFFICE.

ABOUT three years ago the city authorities of Antwerp acquired by purchase the printing-office of Christophe Plantin, the eminent printer of the sixteenth century, the sum paid down for the rich acquisition, priceless from an antiquary's point of view, being 48,000*l*. The undoubted value of the property was pointed out at the time; but we are now supplied for the first time with authentic and full details respecting it by a work of M. Léon Degeorge on the history of this world-famed printing-office and the collections contained within its walls.

The house itself as it now stands is a large, handsome, square building dating from the fifteenth century, the façade of which was restored in 1761. It comprises a private residence, the type-foundry, the printing-office, reading-rooms, library, archives, and a number of offices, carefully preserved in the same state as they were in during the time Plantin flourished. When entering through the vaulted gateway, the square extending round a large courtyard strikes the visitor with a happy effect. There are niches between the windows, in which the busts of celebrated printers are placed, most of them encircled by the wreaths of the vine which Plantin is reported to have planted with his own hands 300 years ago.

The oil-paintings are as numerous as they are valuable, and, with the exception of six, are portraits either of members of the family or of eminent persons in connexion with the latter or with the business. No fewer than eighteen are ascribed to Rubens, who was a frequent visitor at Plantin's house. In the archives of the house are still preserved the various receipts he signed for the sums paid for the pictures. The most remarkable of the portraits are those of Christophe Plantin, his wife, his daughter Martine, his son-in-law Moretus, of Ortelius, Justus Lipsius, and of Arias Montanus, the well-known editor of the large polyglot Bible, printed for the King of Spain, and still known by the name of the Polyglot Antwerp Bible. There are seventeen other portraits, of which perhaps that of Balthasar Moretus,—one of the best of Vandyck,—is doubtlessly the most valuable. Most of the pictures are by Pombus, and some are quite excellent.

The engravings are very numerous, very beautiful, and for the greater part also very rare. There are many large portefeuilles full of copper-plate engravings by Rubens, Teniers, Vandyck, and Jordaens; and others, again, are filled with the works of Cris de Passis, de Gallé, Sadelers, and other engravers, all *avant la lettre*, and the most careful impressions. There is, besides, a precious collection of original sketches of old masters, nearly 400, of which eleven are by Rubens, and attested by his signature. The jewel of the collection, however, because of its great rarity, is represented by six engravings by Peter Boel, entitled "Diversi Uccelli," and all in the most perfect state of preservation. Next to mention is "La Petite Passion," by Albrecht Dürer, in fifteen plates, engraved by Van Leyden, and, finally, sixty portraits of the Dukes of Brabant and the Counts of Flanders.

The library contains 10,000 volumes, among which are a great many curiosities, first being Plantin's chief work, the large polyglot Bible, edited by Montanus, of which there are three specimens in this collection, one being printed on vellum. The work comprises eight large folio volumes, and is printed in Greek, Latin, Hebrew, Chaldaic, and Syriac. The casting of the type and the correcting of the proofs kept forty people steadily at work for four years, and the compositors had to undergo a sort of training to fit themselves for this kind of work. The total expenses of printing were estimated by Plantin at 40,000 crowns. Among the delights of bibliographers are also numbered the Pfister Bible, from the year 1459; a "Sacrum Breviarium," from the printing-press of Theod. Martens, of Louvain, and a vellum "Cicero" (1466) from the press of Johann Fust, as well as numerous *editiones principes* of the classics, besides other curiosities, a great number of books, pamphlets, and placards, among which some are unique, illustrative of the history of Belgium.

Of manuscripts there exist about 200, some of them exceedingly valuable. In most collections of manuscripts, writings of the fourteenth century are very scarce; but here we find them of the twelfth, tenth, and even ninth centuries. Amongst those of the fifteenth century the most striking work is an illuminated Bible of the richest execution. Its date is 1402, and it is a rare treasure. As is to be expected, from the fact that Plantin published principally works of classic literature, the majority of manuscripts are those of Latin and Greek authors. Their writings were of extreme value for the collation of the text and the correction of doubtful or contested readings. This section of the "Maison Plantin" by itself is a real treasure-house.

In the archives are preserved all the account-books of the firm from its establishment down to the balance-sheets of most modern date. From 1566 everything referring to buying or selling is entered regularly from day to day. Here we find the large memorandum-books, the bonds of Rubens, all the orders for payment of Philip of Spain, as well as remarks respecting business connexions. The books kept of wages paid by the establishment form the surest index of the rates of wages paid for printing in the sixteenth, seventeenth, and eighteenth centuries, and for three centuries tell us exactly the weekly pay of "clickers," compositors, wood and copper engravers, bookbinders, &c. But of the greatest interest in these archives are the "letter-books," in which the correspondence of the house has been preserved. The number of remarkable autographs is very large indeed, and all the letters are arranged chronologically. Here we find autographs of sovereigns, eminent statesmen, philosophers, historians, and artists, by the side of the most celebrated printers of England, France, Germany, Italy, and Spain. But few of those letters have yet been published, and many among them would throw a striking light on the literary world of the sixteenth and seventeenth centuries. We have also in this collection royal diplomas, inventories, testaments, genealogies, reports on business journeys and family matters; the pearl among such documents being Plantin's autobiography, in which he has sketched the hopes and fears, the disappointments and successes of fifteen eventful years. One of the above letters contains an interesting fact from the life of Plantin. The King of France sent him a patent, appointing him the "King's Printer,"—an appointment as lucrative as honourable; but Plantin, acting upon the advice of the Spanish ambassador, declined the distinction, and was satisfied with being the "Architypographus" of Philip II. of Spain. The Duke of Savoy and Piedmont also sought the services of Plantin, invited him to Turin, and offered to purchase his whole establishment at a price fixed by Plantin himself, adding besides a bonus of 1,000 gold crowns. Beyond this handsome offer he promised to found new and large printing-offices at Turin, the direction of which was to be entirely entrusted to Plantin, *carte blanche* being accorded to the latter for the expenses incurred. But nothing could entice Plantin from Antwerp, and he declined also this advantageous proposal.

A few words should be added respecting the valuable collection of Sèvres, Chinese, and Japanese porcelain in the Plantin Museum. There are, amongst other rarities, six cups of "porcelaine [verte de Chine," for which a connoisseur of Moretus offered, a few years ago, 15,000 francs, without securing them. The collections of coins and minerals are no less valuable.

But the printing-office itself is no less interesting. There are still racks full of type cast several centuries ago in the foundry close by. The "divisorium" [an implement unknown to the English printer, the latter being contented with dashing down his "copy" on a dirty "case"; hence the unclean state in which only too generally "copy" is returned to the author] still carries "copy" in the position most convenient for the compositor, and every requisite lies and stands ready to hand, so that the visitor is under the impression that he has dropped in during "dinner-time," and that active life will soon flow again in the rooms he is inspecting. As in the region of "cases,"—the composing-rooms,—matters are the same in the press-room; it looks as if work was to commence at once, although of the seventeen presses which Dr. Thou observed in 1576 only five are left. Two date from the sixteenth century, but only one is in working order, and used for the purposes of the museum.

And what do these cupboards contain? Within them are preserved about 15,000 wood-cuts, illustrative of the history of three centuries of the art of wood-engraving. There are "blossoming initials," as the Dutch called letters decorated with flowers, of all dimensions, a number of head and tail pieces, vignettes, imprints, and what the French call "culs de lampes." There are beautiful illuminated initials, no doubt intended for a missal, which have not been used at all, while many very good drawings on wood wait for the graver. But not only are there wood-blocks here; there are about 8,000 copper-plates, carefully preserved, among them illustrations and handsome title-sheets of bygone times. In an especially beautifully carved cupboard are preserved the punches, matrices, and forms which were the cause of Plantin's fame. Many of them are from the hands of Guillaume Le Blé and Claude Garamond. By the side of all these curiosities we find several tons of new type, never used, with the dust of several centuries upon them!

The city of Antwerp has thus acquired a treasure which no visitor to the town should fail to inspect, and which forms a better monument than bronze or iron to the simple but intellectual work of a family of printers.

ASSYRIAN STATUETTES.

WHEN the first instalments of the sculptured slabs from the palaces of the Assyrian kings arrived at the British Museum, it was noticed with regret by many students of sculpture that the examples were almost entirely of the bas-relief class, and this want has never been removed by subsequent explorers. The few examples of statuary which have reached us are of so inferior a kind as to fall far behind the reliefs in their workmanship. The Babylonian statue of Venus in the Assyrian vestibule is rude, stiff, and totally unworthy of the predecessors of the sculptors of Nineveh. The statues of Nebo erected by Rimmon-nirari, in B.C. 890, in Calah, have no art treatment whatever, and show a knowledge of the nude far behind the bas-reliefs of the same period. The statue of his son, Assur-nasir-pal, B.C. 886, is small and stiff, and the drapery exhibits arrangement of a kind unworthy of art. The face and head are treated, however, in a most minute and realistic style, similar to that exhibited in the *relievi*. Seeing the want of some treatment of the Assyrian figures in the round of a higher class than that above mentioned, Mr. Hayes, an attendant at the British Museum, who has attained some celebrity as an amateur modeller, determined to take some of the principal characters portrayed in the slabs from Nineveh, and while adhering closely to the facial expression and adornment of the figure, he would treat them in the round. The result of this experiment has been a series of three very excellent statuettes, which now represent for the first time the figures of Sennacherib (B.C. 705) and his warlike grandson, Assur-bani-pal, the Sardanapalus of the Greeks (B.C. 664). To this pair he has added a statue of the Queen of Assur-bani-pal. This latter is modelled from the bas-relief in the Assyrian basement-room, wherein the queen is represented as banqueting with the king in the palace garden at Nineveh. The queen is clad in a long robe, richly braided and embroidered, while in her hand she holds, as if drinking to her lord, a shallow cup, much resembling the beautiful silver cups discovered by Gen. Di Cesnola in Cyprus. The features are most accurately produced, and from them we gain a strong idea that the queen of the warrior king was not an Assyrian, but of Eastern European or Cyprian birth. The arms seem a little short. The statue of Sennacherib shows him clad in his royal robes, with the triple tiara of his princely office on his head, and the sacred bow of Istar in his hands; his face and attitude give a very pious but warlike son of Sargon (B.C. 721). The statue of Assur-bani-pal is modelled from one of the finest portraits of that monarch, namely, that in which he is engaged in that "pastime of kings," the lion-hunt. The king wears a close-fitting tunic, bound round the waist by a broad band, but cut away at a short distance above the knees, so that his legs, clothed in leather greaves, are free from drapery to impede his action. No helmet covers his head, but a plain broad band or diadem binds his flowing hair, and we see before us, as he stands grasping his sword, a very true likeness of the "Hero King." The same artist has also produced some other *fac-similes* of a winged and human-headed bull, as well as one of the beautiful bronze lion weights. Those who are anxious to have some adequate idea of these kings, who once ruled the myriad tribes of

Assur, will find these most interesting works of art, and by no means unjust to the canons of Assyrian art.

A number of these statues have now been produced from the original clay models in porcelain of a very fine colour, and the set can be obtained from Mr. A. Jarvis, 43, Willis-road, N.W.

LYME REGIS.

THE towns of the south coast perhaps contrast more with one another than those of any other part of England; for most of these belong to two classes, each in direct contrast one with the other. For they consist of small towns, once influential, nay even powerful, seaports, but which are now mere collections of houses, small towns little better than villages; and, on the other hand, they are towns the production of modern requirements, fashionable watering-places, whose area increases yearly, and whose population may be counted often by thousands. Such, for example, are Winchelsea and Brighton, Pevensey and Eastbourne. Let any one visit these four places and he will witness the seaports of the Middle Ages in comparative decay, the watering-places of the nineteenth century rapidly increasing, but each in its own manner characteristic of certain historical and social phases in the history of this country,—each in a certain sense historical foot-prints on the sands of time.

Noticeable among the historical towns of the south coast is Lyme Regis. It was enfranchised by Edward I., and it could aid the ambitious and warlike schemes of himself and his successors by supplying craft for the transport of his armies to France, and it sent ships to the siege of Calais. In the reign of Henry VIII. it was considered of sufficient importance to have granted to it the privilege of holding fairs and a market; and during the Parliamentary and Royalist struggles it sustained, in 1644, a siege of seven weeks from the troops of Prince Maurice, and was only relieved by the timely arrival of the Earl of Essex, all of which, in greater detail, can be read in Hutchins's "History and Antiquities of the County of Dorset"; and when we think how Birmingham was entered without a struggle by the Royalist troops, and of the value of time to the contending armies, it requires but very little imagination to think of Lyme as a seaport of importance. Indeed, before this period, Leland, travelling through England in the reign of Henry VIII., had described Lyme in the third volume of his "Itinerary" in quaint and suggestive words. "Lime," he says, "is a praty market town, set in the rootes of an high rockky hille down to the hard shore. This town has good shippes, and usith fishing and merchauntice." Since those days Lyme has lost its "good shippes" and its "fishing and merchauntice," though Leland's striking description of its situation remains strictly true. It lies, as he says, at the very roots of the hills; there is no level piece for it to be built on, and some of its houses are on the lowest spurs of the hills, some on the hard shore below the proper hills themselves. On the north-west, on the slopes which face the south and the long line of rolling headlands which end with the distant and half-visible Bill of Portland, a few houses of modern character have from time to time been built, but it needs no stretch of imagination, so little has time changed it, to picture it as a seaport of the sixteenth century.

The whistle of the locomotive engine does not reach it from the valley of the Axe, and there is no reasonable probability that the railway will for years traverse the five miles of hill and vale between Axminster and Lyme. Nobody wants it, and it would only transfer a dead seaport redolent of the historical past into a second-class watering-place. For we are quite sure that Lyme has charms for those who prefer peace and picturesqueness to noise and the blankness of long esplanades, and it is no small advantage to find a place where the local pride of its inhabitants is satisfied by the luxury of an historical breakwater, and does not desire to endow it with the largest aquarium or the longest iron pier within fifty miles. At one time, indeed, in the last century, it was somewhat frequented as a watering-place by persons of rank,—thus Lord Chatham frequently visited it for the sake of his health. But Lyme in its Cobb possesses a work not without interest from an historical point of view as illustrative of Mediæval ideas of harbours and breakwaters. For the Cobb was built as early as the reign of Edward III., if not before, and was almost completely destroyed in that of Richard II.; its last restoration was in 1825–6, when 232 ft. of the pier and 447 ft. of the parapet were rebuilt. Starting straight out from the hard shore it gradually circles round towards the east, terminating in that direction. Thus vessels within it are protected from south and south-westerly winds by its encircling shelter, and the bay being sheltered from the north and east by the high lands which bend round to form the east side of the great west bay, ships are thus safe from all kinds of weather. But at the present day it can only contain a few coasting vessels and fishing smacks, so that, as we have said, its interest is now mainly historical. For there were days when it was considered a great harbour, and when within the protecting folds of the Cobb ships which were to sally out to the siege of Calais were collected, and vessels which brought the Duke of Monmouth and his companions lay within its grey shelter. It was undoubtedly planned with skill, considering the requirements of Mediæval times, for it stood the best of all tests, it fulfilled the purpose for which it was built, and within its artificial shelter the sailor was as secure as within the land-locked coves of Lulworth or Salcombe. We could point to more ambitious modern structures of our own age in this branch of marine architecture which are put to shame by this piece of Mediæval work, which in its time was eminently useful. Compare the usefulness in its own day of Lyme Cobb with the uselessness in our day of the breakwater at Port Erin in the Isle of Man, and the Mediæval engineer must receive due recognition for his comparative skill.

Architecturally in other respects there is nothing whatever in Lyme. The church is noticeable internally, indeed, because it has some good glass in its windows, and because it is one of the most appalling sights, from the sheep-pen-like pews, the galleries planted across the windows, and the uncared for roof, which can well be conceived. The public officials of Lyme, too, seem to trust that visitors will also take care of themselves. They have what by courtesy is called the Parade,—a gravel walk by the side of the sea much more charming than parades as usually known,—but though it is some little height above the shore, it is unprotected by any railings, so that a child or a drunken man will no doubt sooner or later break his neck by falling over it. Half way to Charmouth, too, a landslip has fallen, thus leaving a space of thirty yards of the high road with a precipice of some height within a foot of the metalled surface of the road. But with admirable forethought, a person ere he approaches this decidedly unsafe place,—to use a mild word,—is aware of a competitor with one of the telegraph-posts, and after straining his neck to see what can be on the top, he reads,—"By order of the Commissioners. This road is dangerous." When some driver with a shying horse is precipitated over this little precipice, no doubt his lamenting relatives will feel gratified by knowing that on a top of a high pole the local authorities had announced that the road was dangerous. Some might think it would have been well to have purchased another pole, and, instead of erecting them in the air, have placed them by way of a barrier where the road was unsafe. But this, perhaps, would savour too much of modern enterprise. Thus we think there are many to whom Lyme will well repay a visit. Let us conclude with a telling description by a classical English writer, Miss Austen,—a description which those who recollect how much of her story of "Persuasion" passes at Lyme will remember:—"There is nothing to admire in the buildings themselves; the remarkable situation of the town, the principal street almost hurrying into the water; the walk to the Cobb, skirting the pleasant little bay; the Cobb itself, its old wonders and new improvements, with the very beautiful line of cliffs stretching out to the east of the town, are what the strangers will seek; and a very strange stranger it must be who does not see charms in the immediate environs of Lyme to make him wish to know it better. The scenes in its neighbourhood, Charmouth, with its high grounds and extensive sweep of country, and still more its sweet retired bay, backed by dark cliffs, where fragments of low rock among the sands make it the happiest place for watching the flow of the tide, for sitting in unwearied contemplation; the woody varieties of the cheerful village of Uplyme, and, above all, Pinney, with its green chasms between romantic rocks."

Miss Austen touches on places in the neighbourhood of Lyme. We may add to her list by mentioning Sir Henry Peek's new buildings at Rousdon, a couple of miles or so on the Exeter road, placed on a plateau, with wide views over the English Channel. For any one interested in the Old English style of architecture the place is worth a visit: the houses and outbuildings, the lodges, the home-farm, and the garden-buildings, all quite close to one another, form a very complete *tout ensemble*.

A CHRISTIAN "ACROPOLIS:" ERFÜRT, GERMANY.

THE "Acropolis," or high place of the city, in ancient times was not only the citadel, but also the site of the chief temple; thus, at Rome, we find the loftiest hill crowned by the superb Temple of Jupiter Capitolinus, and called the "Ara Cœli," or Altar of Heaven.* At Athens, the Acropolis contained several temples, of which the Parthenon and Erechtheum were the most celebrated. Mount Zion was crowned by the Temple of Jehovah, and various passages in Scripture serve to show us that the dedication of high places to religious purposes was no mere heathen superstition, but one of the earliest instincts of piety implanted in the heart of man, and one which has for its authority and example the practice of the Author of our religion Himself. This being so, it is not remarkable that Christians during earlier times, and in the Middle Ages, so frequently erected churches upon the highest hill of the city, which was generally surrounded by walls of defence: thus we have at Durham a complete example of a Christian acropolis, whilst, in Ireland, the "Rock of Cashel" offers another example. Clermont Le Puy, Beziers, and Carcassone, in France, and Sion, in Switzerland, are also excellent examples. To name those that occur in Italy would occupy more space than we have at our disposal. Those, however, who know Rome well can call to mind the striking situations of St. Pietro in Montorio and St. Onofrio.

Examples of the Christian acropolis are also very numerous in Germany. At Feising, in Bavaria, a great rock rises from near the centre of the town, crowned with the cathedral, bishop's palace, and four churches. At Naumberg is a somewhat similar eminence. Limburg-on-the Lahn is also a beautiful example; but perhaps the most striking example of a Christian acropolis in the whole of Germany is the great hill called the Marienburg at Erfürt. This most remarkable natural platform is about 60 ft. high, completely isolated on every side, and surrounded by a perfectly level plane, which separates it from the rest of the town. About 100 yards to the north is another somewhat similar eminence called the Petersburg; there is a great similarity between these two hills in the centre of the town of Erfürt, and the Capitoline and Palatine hills of Rome. Both the Petersburg and the Marienburg are crowned with churches; but as the former has been converted into a modern citadel, the towers and spires which formerly adorned the church of St. Peter upon its summit have been destroyed, though the church itself still exists. The Marienburg has been more fortunate, and retains its magnificent crown of spires. The most important building upon the Marienburg is the cathedral. This remarkably interesting church consists of a long and very lofty choir (1349—1354), short transepts, a nave and aisles, covered by one enormous roof. Between the transepts and the choir two bays of a former church exist, flanked by lofty Romanesque towers, which become octagonal at about half the height. A third tower, crowned with an octagon lantern, is built over the bays. There is a magnificent triangular porch opening into the north transept, and extensive cloisters, with a large apsidal chapel opening out of the eastern walk. Upon entering the cathedral by the west doorway, the view is disappointing, the nave is rather poor fifteenth-century work, and has neither great loftiness nor admirable proportions to make up for the poverty of the detail. The plan of this portion of the building is extremely ugly. The aisles are each double the width of the nave itself, and of the same height. The square of the vaulting is taken from the width of the aisles, and when applied to the nave it forms a series

* Other sites have been suggested for this temple, but that of the Ara Cœli seems the most probable. It is thought by some that the temple of "Jupiter Feretrius" stood on the "Ara Cœli."

A CHRISTIAN ACROPOLIS.—ERFURT, GERMANY.

of oblong compartments running with the axis of the nave. We do not recollect to have met with this treatment in any other vaulted church; the effect is certainly most unpleasing. The transepts are better architecture than the nave, and look well on account of the row of handsome altars on their eastern sides; two of these altars date from the fourteenth century, and one of them has been illustrated in this journal; the two bays of the old Romanesque nave, which was low and very narrow, connect the transepts with the choir, which is entered through a rather small and narrow arch, fitted with a remarkably beautiful screen of wrought-iron dating from the fifteenth century. The first glimpse of the choir seen through this screen is truly magnificent; it is excessively lofty, and lighted with superb Decorated windows filled with most brilliant fourteenth-century glass in a perfect state of preservation. Below the side windows are canopied stalls, which, although partly modern, retain enough of ancient work and carving to make them interesting. Beyond the stalls on the north side is a splendid credence, with a reredos covered with paintings said to be by Van Eyck. The high altar and reredos are poor Renaissance productions; but in front of the altar is a very fine triple candlestick, dating from the earlier part of the twelfth century.

The church contains several interesting monuments, some of which consist of stone effigies of bishops carved in low relief, with the mitres, bands, and croziers let in in bronze; there is also a very beautiful little monumental tablet of bronze, by Peter Vischer. The font and stone baptistery, and canopy above it, are of a singular design, resembling slightly the English Jacobean work. One of the most remarkable features of this cathedral is the magnificent porch to the north transept; this very beautiful structure is in plan an equilateral triangle, and is externally two stories in height. The lower story is pierced by double doorways; and the upper one by four-light windows; the whole is crowned by a spire of lead.

The cloisters are good examples of German Pointed of the latter part of the thirteenth century. The east wall is double, and has a large chapel opening out of it. There are two crypts, one above the other, under the choir. Placed at an angle of 45 degrees to the north of the cathedral is the Church of St. Severus, commenced in the year 1278, but the greater portion not erected until the fifteenth century. The nave has four aisles, and the choir externally forms a group of three towers, with an apse projecting from the centre one. It is a remarkably interesting building, containing some exceedingly good furniture.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

OPERATION OF THE ARTISANS' DWELLINGS ACT.

At the ordinary meeting of this Institute, held on Monday evening last, Mr. Charles Barry, president, in the chair, the following members were balloted for and declared to be duly elected, viz.:—As *Fellow*: Mr. William Henry Clark, of Bristol. As *Associates*: Mr. Spencer William Grant, London; Mr. Walter Wheeler, London; Mr. Robert Clamp, Hull; and Mr. Isaac Steane, Coventry. As *Honorary Associates*: Sir F. P. Cunliffe Owen; Mr. H. S. Marks, R.A.; Mr. E. J. Poynter, R.A.; and the Right Hon. R. A. Cross, M.P., Secretary of State for the Home Department.

The Secretary, Mr. William H. White, read some letters received from public bodies relating to the subject of Sir James Watson's paper. The Metropolitan Board of Works, in answer to a letter from the Institute asking the Board to present them with sets of plans of the Board's schemes under the Artisans' Dwellings Act, wrote to say that they had pleasure in complying with the request, and in sending, in addition, the deposited plans of the proposed Tower Bridge; plans of building sites to be let by the Board, with conditions of letting; and a map of the metropolis showing the areas condemned under the Artisans' Dwellings Act. A letter from the Corporation of the City of London was also read, stating that Mr. William Haywood, the engineer to the Commissioners of Sewers, had prepared plans showing the areas condemned under two important schemes within the City boundaries, and which the Commission had already in hand, other schemes being under consideration. The Local Government Board wrote, enclosing a report of Messrs. Ratcliffe and Mr. P. Gordon Smith on "back-to-back" houses, but expressing regret at their inability to have copies made of the plans referred to in the report.

Mr. George Vulliamy, Superintending Architect to the Metropolitan Board of Works, said that the Board had given instructions to him to send to the Institute all plans of their improvements, whether "local" or "metropolitan," and of schemes under the Artisans' Dwellings Act; also plans of building sites to be let by the Board, together with the conditions of letting,—which latter, he thought, were very good.

Sir James Watson then read a paper entitled "Improvements in Glasgow, and the City Improvement Acts: Origin of the Artisans' Dwellings Act." Of this paper we print the substance on other pages.

In the discussion which followed,

The President observed that it seemed to him that the most important part of the question with which Sir James Watson had dealt was contained in the latter part of his paper, and had reference to the dwellings of the very poor. Sir James's paper showed how to solve the great problem of diminishing overcrowding by demolishing insufficient, dilapidated, and unhealthy buildings, and replacing them by dwellings which the poor could afford to pay for, and which were healthier and better. In London, the great difficulty was how to house the very poor; indeed, the difficulty was insuperable, and could not be overcome by companies such as that over which Sir Sydney Waterlow presided, inasmuch as the provision of adequate and healthy dwellings for the very poor, at the low rents which they were able to pay, was not commercially remunerative. Experience had shown that there was no difficulty in housing the artisan classes at remunerative though cheap rates. The various companies and societies which were doing this were doing a great work, and they ought to receive every possible encouragement at the hands of public bodies and local authorities. For instance, companies such as that over which Sir Sydney Waterlow presided ought to be helped by the Metropolitan Board of Works in the acquisition of sites at a cheap rate, in consideration of the advantages which their operations conferred upon the community. Indeed, it would probably be found to be a paying policy in the long run to give away the sites for such buildings, in order that the poor might be properly housed. Again, the gas and water companies should remember that they had social duties to perform, and that they ought not to charge for gas and water supplied to large blocks of model buildings on anything like the same scale as that which was applied to ordinary houses. If some such ameliorative principles as these could be laid down, he thought Mr. Cross's Artisans' Dwellings Act would have some chance of that speedy success which was essential to meet the wants of the poor of the metropolis; and he believed that the public at large would feel the benefit of these seeming sacrifices in the saving of the spread of disease, crime, poverty, and wretchedness which was otherwise inevitable, as had been shown by Sir James Watson. In conclusion, the chairman called upon Mr. M'Cullagh Torrens, M.P., who had, in the current number of *Macmillan's Magazine*, shown how the Act of 1868 could, with certain modifications, be made a much more successful and useful measure than it had hitherto been.

Mr. McCullagh Torrens, M.P., said that although no doubt the public bodies referred to, and the companies and societies similar to those over which Sir Sydney Waterlow presided, could do and had done something in the matter, their efforts must continue to be utterly inadequate to meet the necessities of the case. What was wanted was the ready and effective assistance of Parliament. Sir Thomas Chambers and Mr. Goldney were now co-operating with him in asking Parliament to reconsider the question this session, and to amend the Act of 1868 with which his (Mr. Torrens's) name was identified, although it was not passed in the shape in which he introduced it, inasmuch as it was altered in its passage through Parliament, until its effect was to destroy without rebuilding; in other words, it allowed local authorities to use the pick-axe, but withheld the trowel. The result, after a lapse of eleven years, was that acres upon acres of ground (sites of former unhealthy dwellings which had been cleared under the Act), were now lying vacant, and that in the most thickly-built localities. The very fact that this was the case was a great scandal, and he would leave it to every one, whatever his political and social leanings might be, to judge what must be the terrible effect upon the minds of the men, women, and children who, more densely packed in their miserable rooms than before the operation of the Act, could look daily and hourly upon the waste ground created by law,—ground which formerly afforded roof-age and shelter of some sort, however bad. He ventured to appeal to the Home Secretary, to whose keeping were confided the safety and good order of the metropolis, to go and visit, either in person or by his inspectors, the more-than-ever overcrowded tenements in the neighbourhoods where there were vacant sites formerly occupied by unhealthy dwellings, and he would there see where the seeds of anarchy, disorder, and unbelief,—everything which we had to apprehend in the future,—were being sown. It behoved all interested in this question to use their utmost influence in urging Parliament not to let another session pass without doing something towards providing an effective remedy for this state of things. The Bill which he, in conjunction with Sir Thomas Chambers and Mr. Goldney, had introduced into the House of Commons was intended to supply the defects and omissions of the Act of 1868. They, however, were not wedded to words, and if the Bill could be improved and made more effective so much the better. But whatever was done must be done without delay, for masses of the people were, through the supineness of Parliament, living in a state of horrible and miserable aggregation, as he should show the House of Commons on the 7th of May. The efforts which had been made by Sir Sydney Waterlow's company and Lord Shaftesbury's association were very commendable, and agencies of that kind could do much where the local authorities were willing to co-operate; but what was wanted to cope with the evil was to impose upon local authorities the duty to systematically remove all unhealthy and hopelessly dilapidated dwellings, and to facilitate their replacement by habitable tenements. He was of opinion that this duty would be better performed by the various local vestries and district boards than by a central body such as the Metropolitan Board of Works, and therefore the Bill now before Parliament would, in that matter, proceed upon the lines of the Act of 1868, the principal alteration being, that whereas the Act of 1868 only gave power to demolish unhealthy dwellings, the Bill of 1879 proposed to impose the duty of facilitating the erection of new dwellings to take their place. Mr. Cross's "Artisans' Dwellings Act, 1875," though an admirable and very well-intentioned measure, could not, after an experience of four years, be said to have effectually met the requirements of the case. It was one of the cruellest pieces of hypocrisy imaginable to sanction the removal by wholesale of the dwellings of the poor for railway and street improvements, or to compel the removal of unhealthy dwellings on sanitary grounds, and then to say that the working-man "went out of town" to live. The only effect of such wholesale demolitions was to aggravate the evil of overcrowding, for to large masses of the working population it was vitally essential that they should live within easy distance of the factories and shops in which they were employed.

Sir Sydney Waterlow, M.P., said that he had learnt a great deal from Sir James Watson's interesting paper. He and others in London had been working in endeavouring to solve this question for almost as many years as Sir James Watson had been studying the question in Glasgow, but in London they could not claim to have attained success to the extent to which it had been achieved in Glasgow. He quite endorsed all that had been said by Mr. Torrens as to the dreadful desolation and waste going on in and around the homes of the poor through ineffectual legislation. In fact, it would seem as though progress in this direction in London had almost come to a dead-lock. Many years ago he appealed to the Court of Common Council to try to do something with the waste spaces cleared some forty years ago under the Clerkenwell Improvement Act, but without success; and some of the ground was still lying idle, though situate in the very heart of London. Had the land been given away, or sold at a very cheap rate, for the erection of blocks of workmen's dwellings, the ground-rent which would have accrued during all those years, and the improvement in the rateable value of the property which

would have resulted from its being covered with buildings, would have amounted to more money than was ever likely to be got for the land now. Under the Metropolitan Streets Improvement Act of 1872, eleven sites were set apart to be occupied by dwellings for the working classes in replacement of those taken down in the carrying out of the street improvements. Seven years had elapsed, but only three of the eleven sites so set apart for the erection of artisans' dwellings had been let. The buildings on two of the sites were in occupation, and those on the third site would shortly be tenanted. It would be asked, "Why have not the other sites been utilised?" The Metropolitan Board of Works had put them up to let time after time, and had spent a great deal of money in advertising and giving every possible publicity to the fact that the sites were to be let for the erection of workmen's dwellings, but they had not been able to obtain the price they wanted for the land,—simply because they thought fit to make that price such as to be prohibitive of the profitable erection of workmen's dwellings as a matter of commercial enterprise. But during the time that land had been to let, the Improved Industrial Dwellings Company had been able to secure from private owners sites suitable for the erection of workmen's dwellings at prices less than those asked by the Metropolitan Board for land in the same vicinity. Of course he was well aware of the fact that the Board had a public duty to perform in the interest of the ratepayers, but he contended that the course taken by the Board in reference to this matter was detrimental to the ratepayers' interests. The improvement of the assessment consequent upon the erection of large blocks of model dwelling-houses in place of the dilapidated property removed would be worth more than the whole price put upon the land. But the Metropolitan Board of Works was an aggregation of the representatives of metropolitan vestries and district boards of works, and the representatives were apt to take a very narrow view of these large questions. It would be of no use to tell the representatives of Kensington, for instance, that they ought to vote for a motion authorising the letting of sites in the possession of the Board in Bethnal-green at a rate low enough to admit of the profitable erection of artisans' dwellings, on the ground that the rateable value of the last-named parish would be increased by some thousands of pounds. Sir James Watson had stated that the land cleared in Glasgow under the operation of the Improvement Trusts was obtainable for the erection of workmen's dwellings and lodging-houses at 30s. a yard, and that 40s. was the highest price that could be afforded for land for such a purpose in Glasgow. But such prices were only about the minimum of those paid in London. The Improved Industrial Dwellings Company had offered to the Metropolitan Board twice as much money for land,—much more than was asked by private owners,—but had been informed that the prices offered were not considered sufficient. Sir James Watson had shown that in Glasgow they could not afford to pay more than 3s. 4d. a foot,—equivalent, at twenty-five years' purchase, to a rental of 1¼d. per foot per annum,—but the Improved Industrial Dwellings Company had paid at the rate of 3d. per foot; for in some cases, where the whole area of the site obtained could be built over to the desired height without interference with the rights of adjoining owners to the enjoyment of ancient lights, &c., it would pay to give that price for land on which to erect blocks of artisans' dwellings. Sir James Watson had stated that in Glasgow they proceeded on the principle that the demolition should be very gradual, and that, in fact, the erection of the new and improved buildings proceeded faster than the demolition of the old buildings. It was greatly to be desired that we could bring about such a state of things in London, and he thought that if Parliament would withhold the power of demolition until there was some evidence of reconstruction it would be doing a good work. Overcrowding had only been intensified by the operation of the Artisans' Dwellings Act. Another point in Sir James Watson's paper was well worthy the attention of Mr. Vulliamy and the Metropolitan Board of Works, and that was, that the ground cleared in Glasgow was disposed of by public auction. Now that was the very thing for which people in London were asking. It should be put up to auction three times if the Board thought it necessary, and then it should go for what it would fetch,—which would be its market value for the particular purpose of building artisans' dwellings. There were at present eleven sites at the disposal of the Board for the erection of artisans' dwellings. How long would it be before those sites were covered with cheerful, well-ventilated houses for workmen and their families? The Board should be compelled by Parliament to let the land at its market value as sites for blocks of workmen's dwellings. Instead of it being enacted that the Board "may" let the land, it should be enacted that they "shall" let it. Of late years the word "may" had been used far too frequently in Acts of Parliament. He quite endorsed what had been said as to the question of water supply to large blocks of model dwellings. At present the water companies had by far too much their own way, and their conduct was arbitrary in the extreme. Sir James Watson and the municipality of Glasgow were to be congratulated upon the success which they had achieved, and he (Sir Sydney) hoped that London would in the course of a few years be able to boast of a corresponding amount of success. But the success that had been achieved already had been to a great extent owing to facilities for borrowing money at a cheap rate, and he was therefore sorry to say that by the Public Works Loans Bill, now before Parliament, insuperable difficulties were raised to the borrowing of money by imposing terms of repayment which for the first twelve or fourteen years would absorb more than the 5 per cent. which the money was capable of earning when invested in artisans' dwellings. If the Bill referred to became law, it would, unless the Labouring Classes' Dwellings Act of 1866 were exempted from its operation, put a stop to the beneficent work in which his company and kindred societies were engaged for the provision of cheap and healthy dwellings for workmen as a matter of commercial enterprise.

Mr. George Vulliamy, Superintending Architect to the Metropolitan Board of Works, said that the Board was as anxious as Sir Sydney Waterlow or anybody else could be to see the vacant sites in question covered with dwellings for the working classes. It was not for him, as an officer of the Board, to question its policy, but he might mention that he had recommended that the sites should be put up to auction, as he believed that would be the best course to pursue. The schemes submitted to the Board under Mr. Cross's Act] were originally twenty-two in number, now reduced to seventeen. The proceedings in connexion with these schemes were in various stages of progress, and the only clearance of old buildings yet made was on one-half of the area included in what was known as the Whitechapel and Limehouse Scheme.

Mr. Horace Jones, the City Architect, said that the Corporation of the City of London had erected two blocks of dwellings for artisans, viz., Corporation Buildings, in Farringdon-road, and Viaduct Buildings, off Charterhouse-street. The Corporation had not been so fortunate as Sir Sydney Waterlow's Company, for the first-named block of buildings only paid 4½ per cent., and the other block barely 4 per cent. In the latter case, it was true, the tenements were largely occupied by married policemen belonging to the City Police Force, from whom the Corporation did not exact quite so much rent as would be readily paid for the same accommodation by other tenants. The land for both these blocks of buildings cost about 6d. per foot per annum,—a price which would not admit of a fair return on investments in this class of buildings.

At this point the discussion was adjourned until Tuesday evening, when there was a very small attendance.

The President again occupied the chair, and in re-opening the proceedings referred to the extraordinary delay and half-heartedness which seemed to characterise the proceedings of the Metropolitan Board of Works in carrying out the provisions of Mr. Cross's Act. Sir James Watson, in his paper, had said that it did not pay to erect lodging-houses for the very poor in Glasgow on land which cost more than 30s. per yard, or 3s. 4d. per foot, which, divided by twenty-five years' purchase, would give about 1¼d. per foot per annum. The Glasgow people seemed to have satisfactorily solved the problem of providing lodgings which, while within the reach of the very poor, gave a remunerative return on the outlay. This was a most pressing question in London, and any further information which Sir James Watson could give would no doubt be of great use in that connexion. It would be interesting to know what was the cost of annual maintenance in proportion to the gross rents received from such buildings in Glasgow; also what was the per-centage of "empties" or unoccupied apartments per year; how the question of damages done by tenants was dealt with; what was the mode of supervision, and its cost; and whether the floors were fireproof. He should also like to know what was the cubic space allotted to each individual inmate; and, in regard to the tenement dwellings of one, two, or three apartments, how overcrowding was prevented. In the various blocks of model dwellings in London great care was taken at the outset that only the proper number of persons should be permitted to occupy a dwelling; but what was to be done when the family increased, and when the children grew up towards adolescence? Was the family to be turned out on that account? Such a thing seemed to be very hard, and yet the overcrowding of the dwelling by allowing it to be inhabited by a greater number of persons than it could healthily accommodate was perhaps as great an evil.

Sir James Watson said he would reply to some of the questions put to him. He believed that it was considered by the builders in Glasgow that it would not pay to erect such buildings as he had described in his paper, unless they could procure ground at 30s. per yard; but then he ought to say that they looked for a return of 6½ or 7 per cent. He was unable to give the particulars asked for as to cost of maintenance, &c., inasmuch as the Improvement Trust sold the sites cleared to builders, who erected the blocks of dwellings as their own speculations, and managed them themselves, so that they alone could give the cost of maintenance, supervision, &c. The floors were not fireproof. Overcrowding of tenements was prevented in Glasgow by a staff of inspectors, who were empowered by the Glasgow Police Act to enter any house in which there were not more than three apartments between the hours of eleven o'clock at night and three in the morning, and persons offending by allowing their tenements to be overcrowded were summoned before the magistrates and fined. Where, however, it was found that the overcrowding was due to the natural increase of the family, very great leniency was shown, and the fines were only rigidly enforced when the occupiers caused the overcrowding by taking in lodgers. The model lodging-houses such as he had described for single men and women paid extremely well. He was connected with an association which established three lodging-houses, two for men and one for women. One of these lodging-houses accommodated 320 inmates, and the charge was 3d. per night or 1s. 6d. per week, including the provision of soap and towels and cooking utensils, and the use of a reading-room. Latterly the charge had been 3½d. per night, or 1s. 9d. per week. At the end of a period of thirty years they had been able to pay to the persons who contributed the funds 5 per cent. per annum for the whole of the period, and to hand over to the Royal Infirmary a sum of 16,000*l.*, those who found the money agreeing at the outset not to take a larger dividend than 5 per cent. For the first three or four years, however, no dividend was paid at the time. He had not the slightest doubt that such model lodging-houses as he had described in his paper would pay very well in the metropolis if placed in suitable localities, and properly managed.

Mr. Honeyman, of Glasgow, said it was to be borne in mind that the Corporation of Glasgow had not itself engaged in the erection of blocks of model dwellings for families, but only in the provision of model lodging-houses for single men and women. [Sir James Watson, in answer to a suggestion made by the president, here said that he should be happy to send to the Institute all the information he could as to the cost of erection and maintenance of these lodging-houses in Glasgow.] Mr. Honeyman, continuing, said he should have to restrict himself to the somewhat ungracious task of fault-finding, although the spirit in which he did so would not be misunderstood by Sir James Watson, nor, he hoped, by any one else. But, first of all, he should like to mention a pleasing circumstance in connexion with the improvements which had been carried out in Glasgow. When the Improvement Act was obtained, and the areas decided upon, the Town Council asked five or six Glasgow architects (of whom he had the honour to be one) to give them

their professional opinion as to the way in which the selected areas could be dealt with to the best advantage in the laying-out of streets and the erection of new buildings of different kinds. Each architect received an honorarium for his trouble. He mentioned this because he thought it afforded an example which might worthily be followed by other corporations and public bodies. One point which he took occasion to speak of publicly in 1866, when the Act was obtained, was that one of the greatest advantages which might be effected under the operation of the Act would be missed altogether if it were not carried out in such a manner as to insure that a considerable part of the areas dealt with should continue to be occupied by the very poorest. He thought that object had not been gained. The policy of the Glasgow Improvement Trustees had been rather to disperse the population to newer and better localities, and, of course, a great deal could be said for such a policy, although he considered it to be a great mistake. The working population of a great city like Glasgow should be concentrated as much as possible in the neighbourhood of the works in which they were engaged, as their dispersal to a distance involved great hardships. It was a mistake to suppose that density of population was necessarily an evil. It was, of course, palpable to any one who had seen the old "closes" of Glasgow, with their huge tenements erected on each side of a narrow lane having a width of from 4 ft. to 7 ft., without the slightest regard to sanitary contrivances in any way whatever, that in such cases the density of population would be accompanied by an exceedingly high death-rate. But if such large buildings were properly planned and constructed, the experience of Glasgow and London had shown conclusively that a larger population might be housed in such buildings on a given area, without detriment to health, than had previously overcrowded the slums which were displaced by the new buildings. The chairman had suggested that the water companies should partially remit their charges in order that cheap dwellings might be provided for the poor at a remunerative rate; but he (Mr. Honeyman) thought that commercial companies could hardly be expected to do that. But where, as in Glasgow, the gas and water supply was in the hands of the Corporation, he thought that such blocks of dwellings might fairly be supplied at a reduced cost. He did not think, however, that it was advisable for corporations to build houses for the working-classes with rates which they levied from the community, if they could possibly gain their object by any other means. He agreed with the chairman in thinking that public bodies such as the Metropolitan Board of Works might reasonably be expected to facilitate the erection of wholesome dwellings for workmen by granting land at reduced rates, and by holding out other inducements. But if they did not see their way to give direct encouragement in the direction indicated, municipalities and other bodies could, at least, withhold the discouragement caused by the imposition of unnecessary restrictions upon building. For instance, in Glasgow, every room was obliged to be not less than 10 ft. high. Probably Sir Sydney Waterlow's Company would not have succeeded had such a rule obtained in London. On the whole, he did not think that the difficulty had yet been solved. The model lodging-houses of Glasgow, excellent as they were, did not provide dwellings for families of the poorer class. As to the cost of the Glasgow buildings, his impression was that it was about 6d. per foot cube. It had occurred to him, on hearing the remarks of Sir Sydney Waterlow, that if the buildings erected by the Improved Industrial Dwellings Company could be made to pay a dividend of 5 per cent., in face of the fact that in London land cost from 3*l.* to 5*l.* per yard, as against 30s. in Glasgow, there must be some lesson which London was able to teach Glasgow, unless the buildings put up in London cost a great deal less than 6d. per foot.

The Chairman said he was enabled to give the cost per foot cube of the sixteen blocks of buildings erected by Sir Sydney Waterlow's company between the years 1865 and 1874. The cheapest block was built for 5d. per foot cube, and the most expensive one cost 8¼d. The prices of the sixteen blocks per cube foot were as follow:—6¼d., 6¼d., 6¼d., 6¼d., 6¼d., 7¼d., 6¼d., 7¼d., 8¼d., 6¼d., 7d., 6d., 6¼d., 5d., 7¼d., and 7¼d.,—the average price being 7d. per foot cube. The Victoria Dwellings at Battersea, for which he (the chairman) had been concerned as architect, cost 7¼d. per foot,—without the provision of a separate water-closet to each tenement. The tenements varied in the number of the rooms they contained. They were mostly two, three, and four-roomed tenements, but there were some single-roomed tenements, each of which was fitted with cooking-range and sink. There was a water-closet in common to the occupants of every four tenements. He knew that objections were urged against this plan, but to provide a separate water-closet to each tenement would be, he thought, a refinement of delicacy, and it would certainly add materially to the first cost and to the cost of supervision and maintenance.

Mr. Smith said that in some of the blocks of artisans' dwellings which had been erected in many of the provincial towns, especially in the North, it was customary to locate the water-closets in nests or clusters in separate blocks between the living-rooms, and he believed that when properly managed nothing could be more satisfactory. He was under the impression that there was some more recent statute under which, if the land acquired under the Artisans' Dwellings Act were not appropriated for the purpose of erecting workmen's dwellings within a period of three years after it had been cleared, it could be appropriated to the erection of other buildings.

The Chairman read a letter which he had received from Mr. Wyatt Papworth, stating that he understood there was some such subsequent Act or clause. "It has been, I hope ill-naturedly suggested" (continued the Chairman) "that the ground is offered, or pretended to be offered, at a forbidding price, so as to keep it vacant for three years, when this clause will become operative, and, in other words, the purpose of the original Act will be entirely defeated."

Mr. George Jennings, then, on the invitation of the chairman, proceeded to describe one or two of his specialities applicable to blocks of model dwellings. He first of all called attention to his well-known patent sink, which is made of galvanised iron, somewhat deeper than the ordinary stone sink. By a very ingenious yet simple arrangement, the sink is convertible at will into a trough for washing clothes, vegetables, plates, and dishes; and it will also serve as a bath for the baby, and as a lavatory for an adult. This sink has been, and is being, largely used, and is fitted up in the Victoria Dwellings at Battersea Park, where we hear that it is much appreciated. Mr. Jennings also called attention to a very ingenious water-waste preventer, automatic in its action, and entirely obviating the use of the small cisterns,—frequently out of order,—which are generally known by that name. The third contrivance to which Mr. Jennings drew attention was a new form of trapless water-closet.

Mr. Mark H. Judge expressed the opinion that the failure to make progress in carrying out the provisions of the Artisans' Dwellings Act and similar statutes was due to the absence of anything like a proper system of municipal government for the metropolis. Glasgow had shown what good local government could do.

Mr. Charles Fowler said he had been surprised to hear Mr. Torrens express the opinion that the various local vestries and district boards could be best entrusted with the duty of carrying out the provisions of his Act. He (Mr. Fowler) should have thought that such a work could only be safely entrusted to a central body. He thought that it was abundantly proved that artisans' dwellings could be profitably erected, and stated that a speculative builder, in a district of London with which he (Mr. Fowler) was well acquainted, had found it worth his while to give as much as 7d. per foot per annum for ground, upon which he had erected some fairly-well built and planned dwellings.

After a few remarks from the Chairman,

Sir James Watson, in replying on the whole discussion, admitted that the subject was surrounded by very great difficulties. He thought that Mr. Torrens's Act, even as he proposed to amend it, would be imperfect in so far as he entrusted its administration to the small local authorities. Possibly the difficulty might be solved for London by the creation of a body of Improvement Commissioners, drawn partly from the Office of Works, partly from the Metropolitan Board, and partly from the vestries.

A vote of thanks was tendered to Sir James for his valuable paper.

WAGES AND STRIKES.

THE strike of the Durham miners draws attention markedly to the wages of the miners and to the manner in which wages have been for some time regulated. There has been very considerable discussion as to the exact wage earned by the miners in Durham; but it seems clear that at pits where the county average has been earned, and where the full amount of time has been made, the average daily wage earned is a fraction over 5s., and remembering the state of trade and the low price of coal,—a price almost without parallel,—this must be said to be at least a fair average wage. In Durham the difficulty has not so much been the lowness of the rate of wage; but the fact that with that rate of wage there has been a want of the working of full time. Hence, although the average wage is fair, and probably above that of the generality of our coal-producing districts, the actual earnings of the miners have not in all cases been commensurate. Indeed, the amount of the actual earnings of the miner has largely depended upon the class of coal turned out, the demand for coal for coking purposes being constant and not very much diminished, whilst there has been of recent years a very great declension in the demand for manufacturing coal. On the other hand, the demand for household coal has been steady, and there is slow but constant growth in the demand for gas coal; but in both these there has been for some time an over-production, production that is in excess of a diminished demand, because in the time of prosperity in the coal trade there were many collieries opened out. Hence prices are rather forced down for these kinds of coal, and the owners of household collieries have of late especially felt the dulness of trade and the very low prices that have ruled.

As one instance of the low prices that rule for coal, it may be said that whilst one of the chief of the gas companies of the North paid about 11s. per ton for coal used in the year 1875, in the following year the price of coal had fallen to 9s. 5d. In 1877 it was 8s., and last year the average was 7s. 4d. per ton for gas coal delivered, so that from prices comparatively low there has been a very considerable declension. It may be added, too, that whilst the average price of the whole of the coal raised by the associated coalowners in Durham was, in 1873, close upon 16s. per ton, it fell to 10s. 2d. in 1874; to 6s. 6d. in 1875, and to 4s. 8d. at the present time,—the average, including coal of all classes, raised and sold at the pit mouth. It is long since coal fell to prices so low, and therefore it was inevitable that there should be with it a very considerable reduction in wages of the miners producing coal thus lowered in price. Wages in Durham have been for two years stationary, because of the operation of a minimum clause in the sliding scale. When that arrangement was entered into coal-owners and miners generally were of that opinion that coal had reached its lowest level, and hence the addition of the minimum clause to the arrangement. Prices, however, fell; and hence employers, when the time for the renewal of the sliding scale approached, expressed the opinion that a necessary preliminary to that renewal would be a rearrangement of the datum line of that scale. It is on the amount of the fall, which is inevitable, that the Durham strike has arisen.; the employers claiming a reduction of 20 per cent., and the miners offering 7½ per cent. Previously to the establishment of the sliding scale, disputes in relation to wages in Durham were referred for some years invariably to arbitration; and whilst both coalowners and miners affirm their willingness to submit their claim in whole or part to arbitration, there is still a difference between the two,—the miners contending that the whole question should be referred to the arbitrament of an umpire, whilst the coalowners are willing to accept a reduction of 10 per cent., and to refer the remainder of the claim to arbitration; but it is evident that in whatever method the dispute may be settled it must ensue in a partial reduction of wages.

Durham produces nearly half a million tons of coal weekly; and hence the strike has produced a very considerable effect already. A very large proportion of the coal raised in Durham is consumed for purposes of metallurgy,—the consumption of coke being especially large both for the Cleveland blast-furnaces and for those at Barrow-in-Furness and in Lincolnshire. Thus dependent upon the supply of coke from Durham, the blast-furnaces were early affected, and through them the iron-mines of Cleveland

and the limestone quarries of Weardale,—the great industries of the North being naturally interdependent. For a time supplies of coal and coke were drawn to some extent from the few collieries working, supplemented from stocks in hand, but these resources were naturally limited, and "slack-blast" and "damping-down" were inevitably resorted to by the owners of some blast-furnaces.

One of the peculiar features of the Durham coal trade is the position of the unassociated coalowners. They were not bound by the sliding-scale arrangement, and taking advantage of the state of the labour market they obtained reductions in the amounts paid for labour to a considerable extent. And when the associated coalowners gave notice of a reduction, no notice was given by those outside the association, so that their workmen continued working after the general suspension of labour at the associated collieries; but when the workmen's strike became a patent fact the workmen at the collieries not in the association very generally gave in their notices to leave, and worked them out. It is evident that these unassociated collieries form a source of weakness to the united action of the employers, for they take advantage of the associated action, and also of whatever the state of the market allows. It is, therefore, a problem by no means easy to solve, how in an industry like that of the Durham coal trade wages should be regulated. The old barbarous method of strikes is of all the most costly; and the panacea of arbitration so often urged is slow in action, and not economically brought about. The most feasible suggestion is that of a sliding-scale free and unfettered in its operation, for the working of coal is an industry in which the value of the labour is not so much affected by extraneous matters as in some other trades. The price of coal at the pit-bank is easily ascertainable; and there is not that change in the value of the product of a given colliery that there is in the product, for instance, of some of the ironworks, where it has been once or twice attempted to introduce a sliding-scale. Such a method of wage regulation by the fluctuations in the price of the product of the labour is as nearly costless as possible; it is tolerably rapid in its execution, and it has the further advantage of being generally free from abnormally rapid action. But whether by this, or by any other means, there will unquestionably be a greater need now than ever for the devising of some means of prevention of the trade wars such as that which has so materially affected the North.

S.

NEW BUILDINGS IN ST. MARY AXE.

Two large blocks of new buildings of a mercantile character are about to be erected in the neighbourhood of St. Mary Axe, in the City, where several piles of warehouses and offices have recently been built, clearing away a considerable extent of old buildings, and altogether changing and improving the architectural character of this part of the City. Preparatory to commencing the additional new buildings about to be erected in the locality, Messrs. Horne, Eversfield, & Co. have this week had two extensive sales of building materials, in order to clear the sites. The first sale consisted of the materials of a number of houses, shops, warehouses, and other premises in St. Mary Axe proper, upon the site of which new buildings are about to be erected from the designs of Mr. George Low, architect, Basinghall-street. The second sale consisted of the materials of a block of warehouses in Bury-street, St. Mary Axe, the site to be replaced by a block of new buildings, for which Messrs. Hammack & Lambert, of Bishopsgate-street, are the architects. Both sales were numerously attended by purchasers of this description of building materials.

Employers and their Servants.—At the "Law Amendment Society," 1, Adam-street, on Monday evening next, the 28th inst., a paper will be read by Mr. Joseph Brown, Q.C., "On the Bills before Parliament for extending the Liability of Public Companies and other Employers for Injuries to their Servants, arising from Accidents, viz.,—1. The Attorney-General's Bill; 2. Mr. Macdonald's Bill; 3. Earl de la Warr's Bill; 4. Mr. Thomas Brassey's Bill." A discussion will follow the reading of the paper. Mr. Thos. Brassey, M.P., will preside.

STONE *v.* TERRA COTTA.

AT the twelfth annual convention of the American Institute of Architects, a discussion ensued as to the advisability or otherwise of using terra cotta, some notice of which we obtain from the report in the *American Architect*:—

Mr. Stone, referring to a passage in a paper recently read, which spoke of the smallness of the pieces of terra cotta as a reason why stone was preferable, said that he had lately used terra cotta in large pieces for window-caps, and in other places, and found the work, in some cases 6 ft. or 7 ft. long, well and uniformly burnt, straight and free from distortion, and of great strength. He could not see why burnt clay should not replace stone, especially in fire-proof construction, for which it was particularly adapted. Where used in connexion with brick, either perfect similarity or striking contrast of colour could be obtained at pleasure, and it would seem that the modelling of the clay by the artist's hand before burning was as artistic and effective a process as the laborious carving of stone. He thought that the recent fashion of carving brickwork, after laying in the wall, was a step in the wrong direction, and that it was more logical to model the clay in its plastic state, before burning, into the forms required.

Mr. Littell agreed with Mr. Stone in regard to the carving of brickwork after laying. As to terra cotta, he had not himself seen any which was so agreeable to his eye in texture or colour as stone. As in sculpture a plaster cast was less pleasing than the marble original, although the form was the same, so with terra cotta, which resembled plaster in some ways, as compared with stone in architecture. Another point was that to the eye, at least, the impression given by terra cotta was that of weakness in comparison with stone, and he thought it necessary that a material should not only be strong, but look so.

Mr. Post remarked that the durability of terra cotta was shown by its remaining intact in the Roman walls after the walls themselves had crumbled away several inches. He thought part of the bad effect which the use of brick had on the design was due to the inability of the designer to master his material. There was no inherent reason why a design executed in terra cotta should not be as effective, and it would certainly be as durable, as one carried out in stone,—much more so than one in sandstone. He had always brought himself with reluctance to the execution of an important building, which ought to last for ages, in sandstone, which was certain soon to begin to decay, and might perish even within his own lifetime. As to the difference in beauty between the clay and the marble in sculpture, he thought in practice that the clay models prepared to carve from were generally superior to the stone copy. Probably most architects had seen clay models which, as they left the hands of the artist, were very fine, but were entirely spoiled in the reproduction in marble, in spite of the beauty of the material. He was by no means an advocate of the substitution of terra cotta for stone, but thought each was good in its proper place.

Mr. Robertson pointed out that the advantage of carving on brickwork over terra-cotta ornamentation of the same kind was that the carving of the brickwork was done in place, and could be controlled with regard to the effect which it was intended to have from the place where it would be seen, while a terra-cotta panel or ornament must be modelled and burnt separately, and to some extent in ignorance of what its effect would be in place, and it was quite possible that the result would be disappointing when the work was set and it was too late to alter it.

Mr. Loring asked how Mr. Robertson would alter a moulding cut on the brickwork, if he was not satisfied with it; or whether, if it could not be altered, there was any way of insuring that the carving would be free from mistakes?

Mr. Robertson said that mistakes could not be avoided absolutely, but that the chance of obtaining a good effect was better when the designer could study the execution on the spot, than where the material must be wrought elsewhere and brought to its place.

Mr. Loring asked if it would not do to have the soft material modelled in place.

Mr. Robertson thought that would be an advantage, if practicable.

Mr. Loring considered it perfectly practicable, and that there was no more difficulty in modelling the clay in the place it was to occupy than in carving stone in place, with the advantage that a mistake in stone sculpture could not be rectified, while the clay could be added to and changed at pleasure, and fixed by burning when the desired effect had been obtained.

Mr. Post thought it would be much more advantageous to have the clay modelled from the drawing by a skilful artist, and then burnt, than to entrust the execution to a journeyman carver. He felt safer with a man held to strict conformity with the drawings by section lines and careful indication, than in sending a workman, perhaps skilful or perhaps not, to execute the work in place according to his own fancy. He thought it would be difficult to carve brickwork so that the joints would not in the course of years be washed out in a trying climate.

Mr. Stone asked what expedient was resorted to in carving brick to overcome the difficulties arising from the porous or cellular structure which most bricks exhibited when broken; and Mr. Robertson explained that special bricks were made for carving, which were homogeneous in texture throughout.

The President wished to say a word in regard to the remarks that had been made in the course of the discussion on the difficulty of getting good carving in stone or marble. He thought it was entirely practicable to get as good sculpture for architectural decoration as ever was executed. In the public buildings in Philadelphia the sculptured parts were first modelled in clay by skilful artists, and carefully corrected in place before handing them over to the workmen for execution. The model was photographed, and the workmen followed it exactly. The sculpture for the Capitol at Washington was modelled by Mr. Crawford, and the design was so exactly followed that the finished sculpture could not be distinguished from the model. He thought there was a tendency to ignore the part of the workman in the carrying out of a design. We had men who could do as good and intelligent work as the artisans of any age, and these should be sought out and their position recognised.

Mr. Walter continued with some remarks about the best kind of building stones for use in structures intended to be permanent. In his opinion, the true marble was not fit for building; nothing but granite and dolomite, or magnesian limestone, could be depended upon. Architects employed sandstones and marble without sufficient study of their qualities. Marble was quickly acted upon by the acids in the air, particularly by the sulphurous acid evolved from burning coal. In the Mint at Philadelphia it was necessary to take out the marble columns and replace them with granite. No stone that would effervesce with acids should be put into a building, nor any which, like sandstone, crumbled away with the weather. Dolomite, unlike the ordinary marble, was unaffected by acids. A drop of muriatic acid on a piece of marble would run through it, while on dolomite it would remain like water. The crushing strength of dolomite he had found by many experiments to be more than three times as great as that of marble. It was dolomite which was used in the public buildings at Washington, and in those of Philadelphia.

Mr. Loring remarked that terra-cotta, or burnt clay, offered a material which could not be affected by acids, and whose crushing strength exceeded that of any stone, under favourable circumstances.

A Versatile Vicar.—The Rev. George Sauger, vicar of Carlton-in-Cleveland, who is said to be an able preacher, has (according to a North Country paper) issued a circular to his parishioners, in which he says,—

"I feel sorry for the necessity of a letter to vindicate my conduct in rebuilding the parish church, which became so dangerous after last August gales that service could no longer be safely conducted under its roof. If I had not taken upon myself the rebuilding, the burden would have fallen upon the parish. You must all be aware that I have worked as few clergymen ever yet worked to rebuild the church. I worked as a bookbinder, to get the money, for two years: obtained the subscriptions, writing upwards of 2,000 letters; designed the building, acted as clerk of works and contractor, carved all the wood and stone, and worked with the men employed, and I ought to be allowed to complete the work in peace, not be publicly insulted for the benefit I have conferred upon the parish in building a church which, for elegance, is second to none in this locality."

We do not know the circumstances which called forth this "vindication"; but the writer would seem to be a remarkably energetic man, although, perhaps, somewhat over-sanguine as to his ability as an architect.

THE BELGIAN JUBILEE HALL.

On Thursday, the 17th inst., the tenders for the erection of the hall in which the fiftieth anniversary of Belgian Independence is to be celebrated, and which is to be preserved for the purposes of a national museum of art industry, were opened in the presence of the commissioners and the contractors who had sent in their offers. It was found that the highest tender was 1,921,500 francs, the lowest 1,392,000 francs, while the Government estimate for the work amounted to 1,555,000 francs. The announcement as to which was accepted has yet to be made. The commissioners to conduct all business connected with this national celebration were appointed the previous week by royal decree, and include the burgomasters of Brussels, Antwerp, Ghent, and Liège, the Belgian commissioner at the Vienna and Paris Exhibitions, and several other persons.

COMPLETION OF THE NEW HIGHGATE INFIRMARY.

The new infirmary at Highgate, which has been built for the purposes of the Holborn Union, and a view and description of which appeared in the *Builder* a short time ago, is now completed, and is intended to be formally opened in the course of a week or two. The building, which has taken more than two years to erect, is the largest and most costly of its kind in the metropolis, the outlay upon it having been about 80,000*l*. At a recent meeting of the Board the building committee reported that Messrs. Snell & Son, the architects, had received notice from Messrs. Mowlem & Burt, the contractors, that the building would be given over by them in less than a month, and the architects recommended that no time should be lost in taking possession. It was added that a formal order had been given to the contractors not to proceed with the colouring or the papering of the walls, as in this weather it would be quite useless to do anything of the kind until the arrangements were made for the occupation of the building. At the present time the building committee are engaged in appointing the necessary officers preparatory to the opening of the establishment, and at the meeting above referred to it was resolved that a letter be written to the Local Government Board asking for the sanction of the Board to the salary proposed to be given by the guardians to the engineer, and on that being received that no time be lost in taking steps to elect an engineer.

ART AND ITS MOTIVE.

Sir,—It would be of little use contending with writers whose notions are so confused, and whose sense of inconsistency is so dull as the advocates of "art for art," if it were not for the outside public, who might be led astray, and into thinking it was learned and authoritative discourse. When a correspondent can quote such a passage, as "Evelyn Pyne" does in last week's *Builder*, and maintain its consistency, no argument is likely to be of any avail. For the convenience of the readers of the *Builder*, however, I will put the two passages which "Evelyn Pyne" maintains are consistent side by side. Here they are:—"We cannot easily bring ourselves to believe that either moral or artistic self-consciousness can inspire true art-work;" "Nevertheless, all art is essentially self-conscious." These contradictions occur within the space of ten lines. Can any one after this affirm that I was unjust in twitting Mr. Caine with inconsistency?

"Evelyn Pyne" may be unable to recognise the tenets of this clique when divested of their flimsy, flouncy attire, but there they stand in my last letter, with all this trumpery torn from their backs, and without even a verbal apron to disguise them. Can a writer who sums up the whole duty of the artist in that of "painting what he sees" be considered at all qualified for writing upon art topics? The photographic camera is "Evelyn Pyne's" artistic ideal, it is not in the slightest degree self-conscious, and renders faithfully what it sees! Did Raffaelle paint what he saw in his "Dispute," or in his "Heliodorus," or in his Cartoons? Did Michelangelo paint what he saw in his "Last Judgment"? or did Phidias carve what he saw in the famous statues of Jupiter and Minerva? Why, sir, such a doctrine as that of "Evelyn Pyne" would subject any one who held it to the suspicion that he was unacquainted with the A B C of art.

If any artist may be conscious of his own virtue, surely it cannot be a sin to be conscious of his picture's virtue. If a painter had no conscious moral purpose in his work, it is difficult to see how he would deserve any credit if his picture should fortunately turn out to have one. A picture, according to the art-for-art folk, may have a moral purpose, only the artist must not know it, and nobody must whisper it to him, or his work will no longer be a work of art. This puts me in mind of the Irishman with a string to the hind leg of his pig, who begged no one would whisper that he was going to Cork as the pig thought he was going to Dublin. But if a work of art may have a moral purpose, and yet be a work of art, as my opponents have not yet gone quite so far as to deny, surely it would redound more to the credit of the artist if that purpose were by design, and not by a fluke. "Evelyn Pyne's" co-urgers of art for art lay much stress on genius being divine, but to the workings of the Divine, conscious purpose has always been attributed,—and "He saw that it was good."

Good heavens! are we in this year of grace 1879 to be told that the highest art is to be the offspring of uncontemplated, unwilled purpose, of blind chance, of yielding to a mood! What has the world come to that such nonsense can be tolerated,—even pass current with a few? This kind of talk is really the "goody-goody" of the art-for-art gossips. It would seem like some doctrine of the Nirvana, in which life is to swoon through existence destitute of all manly energy and purpose. ART FOR GOOD.

*** Here the correspondence, so far as the lecture in question is concerned, may end. The main point, however, is still open for independent discussion.

CHISELBOROUGH-CUM-CHINNOCK.

Sir,—The Rev. C. F. Newell, rector of the above parishes, says he may be a "cretin," but that he most certainly is not a pluralist. I never said that he was a cretin, although I mentioned the existence of interesting specimens of those unfortunate people in his district. If, however, a clergyman has the charge of two distinct villages with two churches I believe I am right in calling him a pluralist. . . . . .

Now for the noble landowners between whom Chiselborough and Chinnock are squeezed as between the jaws of a vice. When the old correspondence took place in the *Builder*, Mr. Newell said it was not Lord Portman's estate upon which the cottages complained of were situated. Now, he says it is not Lord Ilchester who is to blame. I see that the Earl of Egremont is patron of the living of Chiselborough and West Chinnock,—perhaps he ought to share a little of the blame. Anyhow, Mr. Newell evidently thinks his parishes have nothing to hope from three great earls, for he says it would be a fine thing if I and my friends would buy up and rebuild these miserable cottages. I dare say the reverend gentleman is well aware that improvements and any kind of enterprise for the well-being of the people have to come from citizen-traders as a rule, and not from members of the House of Lords. But I should like to know who has property for sale in these villages. Not the labourers, I am sure. The labourers have been despoiled of their little possessions by every kind of paltry dodge. Not only was there the giving of 2*s.* to have 1*s.* returned in order to prove a peppercorn rent, but many others, such as sending a whitewasher or a thatcher to do a few shillings' worth of work, and taking 1*s.* per year as payment. I tried to purchase a house in my own native village (Montacute) not long ago, but I found that money would not buy it. The place had been bespoken by the landowner's agent solely because there should be no new proprietor allowed in the village. The story of the spontaneous combustion of a large double hayrick is quite as good as that such a stack was fired from the outside. I should think that rick must have been rather heavily insured, and that perhaps the bad times had something to do with it. But, does the rector of Chiselborough and West Chinnock mean to say that, because a hayrick caught fire one night, the whole parish of Chiselborough was justly put under sentence of eviction, the most convenient part of which sentence, I will be bound to say, has been carried out? And it scarcely tallies with what Mr. Newell implies, namely, that the cottages are in the hands of small proprietors, that such notices could have been given. They must have proceeded from one of the noble landowners. I had some of the most piteous letters from the poor inhabitants of Chiselborough, begging and praying for my interference. Why did they not go to Mr. Newell? I suppose they knew that he was too deep in with the landowners. They applied to me as an old neighbour. I applied to Archdeacon Denison, as a man of some authority with the clergy, to stir up his clerical brethren against this cruelty; but he wrote that, much as he sympathised with the people, he was getting too old to be mixed up with such affairs.

GEORGE MITCHELL,
"One from the Plough."

ST. PAUL'S CATHEDRAL.

Sir,—The condition of the monuments in this "noble pile" is not creditable. Covered with dust and dirt, it would be very difficult for any ordinary observer to say of what material they are composed; and this has been the sole condition they have been in for a long time past.

And I would respectfully ask the Dean and Chapter, through the medium of the *Builder*, when the restoration of the Queen Anne statue, with the figures surrounding it, in front of the most majestic elevation the world ever saw, is to be attempted? The condition of this group is perfectly disgraceful to the cathedral authority and the City of London.

Go to Westminster Abbey. How striking the contrast. The marble monuments are kept in the most beautiful order, free from dust and dirt, and a perfect credit to Dean Stanley and the Chapter.

As to St. Paul's, the frequent pulling down and fixing up keeps the noble edifice in a constant state of transition, and promises fair for a permanent chaos. R. PAYNE.

TEDDINGTON CEMETERY.

The above has now been completed, and the Church of England part was consecrated on the 9th of April by the Bishop of London. The whole site is a plot nine acres in extent, five acres and a half of which have been laid out for present requirements, divided about equally into consecrated and unconsecrated portions by a path 18 ft. wide, and with this exception there is not another straight path, all being laid out in easy curves, and thus departing from the gridiron arrangement usually seen.

The chapels are of fourteenth-century Gothic, identical in design, and connected by a covered carriage-way over the central path, and spanning which is a bold entrance-arch flanked by towers (in which are the vestries), and surmounted by octagon lanterns and crocketed spires. The chapels are each 30 ft. by 20 ft. internal dimensions, lined with white bricks and relief-stamped tiles by Minton. Seats are arranged stall-wise, and are, with the open roofs, all of deal, stained and varnished. The reading-desks are of pitch pine, by Hammer, from the architect's design.

A mortuary is provided fitted with slate shelving and conveniences for "*post-mortems*." At the entrance is a lodge containing office and living-rooms, toolhouse, &c.

The front railing is by Handyside & Co.

The material used for the walling is Bargate ragstone, from Godalming, and Box-ground Bath-stone for dressings.

The contractors were Messrs. Harris & Bonell, of Teddington, and the whole has been carried out from the designs and under the superintendence of Mr. T. Goodchild, architect, Adelphi, London.

ARCHÆOLOGICAL SOCIETIES.

British Archæological Association.—This Association having accepted the invitation of the Mayor and Corporation of Yarmouth to hold their annual Congress in that town, in August, the Town Council has appointed a committee to make arrangements for receiving the Association.

Royal Archæological Institute.—At the last meeting of the Taunton Town Council, the General Purposes Committee was appointed to co-operate with the Somersetshire Archæological Association and other bodies in making arrangements for the reception of the members of the Archæological Institute, who will hold their annual congress in Taunton in August.

TRAMWAYS.

SOCIETY OF ENGINEERS.

AT a meeting of the Society of Engineers, held April 21st, in the Society's Hall, Victoria-street, Westminster, Mr. Joseph Bernays, vice-president, in the chair, a paper was read by Mr. J. L. Haddan, on "The Essentials which should govern the Construction and Working of Tramways." The author observed that when tramways were first introduced, they were a great advance upon the ordinary roads, but that the modern improvement of roadways had, in the present day, led almost to a reversal of the relative positions of road and tramway. In America, the tramways were superior to the roads, because the latter were sacrificed to the former. The tram-rail there, moreover, was available for the moderate ordinary traffic, whilst the speed of the tram service was about 20 per cent. greater than in this country and on the Continent. Mr. Haddan alluded to the general tendency to employ wood in roadways, and he described a system of construction by which a road could be made with a perfectly flat surface, and yet be well drained, and which should have the tramway incorporated with it. The tram-rails, he said, would be of wood, and the roadway would be kept surfaced with grit, so that the wood would not form the actual wearing surface. This system of tram and roadway, the author observed, would be homogeneous, and would combine the best possible road for ordinary vehicles, with a perfect tramway for special carriages at less cost than the present method of construction. The author condemned the indiscriminate introduction of railway and omnibus principles into the construction and working of tramways, and described his proposed arrangement for meeting the requirements of a tramway service. This consists of a locomotive engine to be worked by steam and air, the steam being used for compressing, during the journey, its own supply of air as well as that which supplies the continuous motive power for propelling the cars. By reversing, the same driving mechanism acts as a continuous brake, and the same system is so arranged that the driver constantly feels the pull of the train upon a regulator handle. The withdrawal of his hand from this handle is to instantly cause the steam power to block the train. Thus the brake mechanism would always be in action, instead of lying dormant, as in ordinary continuous brakes. The author, in conclusion, stated what, in his opinion, were the technical, physical, and administrative requirements of mechanical traction on tramways generally.

FACTORY AND WORKSHOP INSPECTION.

MR. ALEXANDER REDGRAVE, C.B., has issued his first report as her Majesty's chief inspector of factories and workshops for the United Kingdom. It states that, pending the discussions upon the Bill for consolidating the Factory and Workshop Acts, and until the coming into operation on the 1st of January last of the new regulations embodied in the Act of 1878, much of the time of the department was taken up in preparing for the new departure. No period could have been more favourable for adjusting incongruities and modifying systems, inasmuch as the state of employment has been universally such that but few inducements exist either for prolonging the legal hours of work or for employing children or young persons below the proper age. The return of prosecutions may show an apparently long list of persons who have been summoned; but when it is considered that every trade or occupation in which manual labour is exercised is, with some few exceptions, under restrictions more or less numerous, and that during a period of depression the utmost efforts are made to produce as cheaply as possible, and the occasional inducement to "complete an order under contract" is very powerful, the list will, in reality, not be so heavy. The total sum imposed by way of fines amounted to 508*l.* 12*s.* 2*d.* The work of factory inspection has become more and more varied and complicated year by year. Inspection, commencing in 1833, was directed to overcoming opposition, which necessitated the extensively enforcing the observance of the law by fines. The duties of the inspector were severe and harassing. Employers strenuously opposed reduced hours of work; parents claimed the labour of their children, seeking by every contrivance to evade the necessity of school attendance, and to pass their children off as older than they really were. The absence of any civil registration of births, moreover, rendered proof of age unsatisfactory, and there were constant difficulties arising in this respect which were not easily remedied. The general acceptance of the factory regulations has greatly lightened the work of the inspectors in some respects during recent years. The definitions of the Act of 1878 alter the effects of the Act of 1867, as many establishments which were non-textile factories under that Act are now workshops, and establishments which were workshops are now non-textile factories. The enactments of the new law, arranged as they are methodically and carefully, embrace matters which had no place in the earlier Acts. The hard-and-fast line is now an undulating and elastic one, drawn to satisfy the absolute necessities and customs of different trades in different parts of the kingdom. The time of beginning and ending daily work, which is almost indigenous in the cotton districts, would be impossible in other places. The lime-washing, so necessary in a bakehouse or in a textile factory, would be useless at a blast-furnace or iron-mill. The regular and unvarying hours of work in a cotton-mill, where the rapidly revolving machinery draws upon the unremitting attention of the operative from week's end to week's end, would not admit of an extension of hours to meet sudden emergencies, as in the case of occupations in which the operatives have to meet regular slack seasons, when short hours and frequently less than half-time prevail. There are five superintending inspectors, the work of whose several districts has been arranged so as to equalise as much as possible the work of each inspector, taking into account the density or scattered position of factories, the means of access by railway, the time that would be occupied in travelling, &c.

ALL HALLOWS TEMPORARY CHURCH, SOUTHWARK.

FROM the designs of Mr. C. N. McIntyre North a temporary church has been built in Orange-street, Southwark, which is certainly meritorious. The building is framed and bolted together, so that it can be taken down and re-erected at trifling cost. Outside it is very plain, with a three-light window at the west end, and a small bell-cote projecting from the face. The roof is formed of boarding, in squares, screwed to the purlins, then covered with felting, and slated. The roof is all in one plane, except at the apsidal end. The transepts (forming recesses for the harmonium and vestry) are very small, owing to the necessity of keeping within certain limits prescribed by the plan of the permanent church. The church is furnished with chairs, and will seat about 280 people, exclusive of the choir. The church is warmed by three of George's Calorigens, which answer very well. The vestry is warmed by a gas-stove, and has lavatory, &c., adjoining. The walls are of brick; the lights have deal chamfered frames, with oak cills, and are glazed with lead glazing. The heads and cills are of York stone. The boarding of the roof is sized; the remaining woodwork is stained and varnished.

Mr. Baguley was the builder; Messrs. Benham & Froude supplied the gasfittings and book-desk; Messrs. Millar did the gasfitting, Mr. Evans the wrought-iron dog-grate, &c. The corona was the gift of the architect; with this exception the cost of the whole, including fittings, has been only 694*l.*

The Gorleston Breakwaters.—Some years ago the sea made such encroachments upon Gorleston beach and cliffs that the construction of breakwaters was determined upon, such being designed for the double purpose of preventing any further scouring of the land, and to protect a portion of the South Pier. The work was done, but for some time (says the *Norfolk Chronicle*) it has been known that the object for which these structures were made has not been attained. Still beach and cliff continue to be swept away by the heavy seas which easterly gales roll into the South Ham; and continually, as soundings prove, does the depth of water increase in this vicinity. Temporary repairs are necessary, but it is suggested whether it would not be better at once to take into consideration some large scheme, which, though expensive at the outset, would be more lasting and more effective.

PARLIAMENTARY JOTTINGS.

Royal Parks.—In the House of Commons, on the 17th inst., on the motion for going into Committee of Supply, Mr. Dillwyn rose to move,—

"That in the opinion of this House any royal or public park or pleasure-ground which is unremunerative, by reason of its being used for purposes of recreation or ornament, should be placed under the control of the First Commissioner of Works, and the amount required for its maintenance included in the annual estimates for parks and pleasure-grounds, instead of (as in the case of Windsor Great Park) being placed under the Revenue Department of Woods and Forests."

The parks, he observed, ought to be so managed as to be made productive, and he hoped that next year her Majesty's Government would see their way to carry his suggestion into effect.—Sir H. Selwin-Ibbetson, in reply, said that at the time of the settlement of the Crown lands, in the reign of George IV., provision was made for passing all the surplus revenues to the Exchequer after the payment of expenses. But by a later Act (14 and 15 Vict.) a certain number of the parks were passed from the control of the Woods and Forests to that of the Board of Works. No such provision, however, was made with regard to Windsor Park, the reason being that Windsor Park was looked upon to a certain extent as a part of the royal residence. A very large portion of the expense was really incurred in the interest of the public. He referred to the expenditure that was necessary for the protection of the park. Under the good management of the Woods and Forests the revenue had increased so as to be far in excess of the Civil List, and had, in fact, amounted to more than 410,000*l.* The change advocated by the hon. member might possibly reduce the cost somewhat, but it would be at the expense of the interests, not of the Crown, but of the public.

Maintenance of Royal Palaces and Public Buildings.—In Committee of Supply, on the 18th inst., on the vote to complete the sum of 35,540*l.* for maintenance and repair of Royal Palaces, Sir G. Balfour said that the nation, having made a bargain with the Crown, should of course adhere to it; but it could not be denied that the palaces of Hampton Court, Holyrood, and others were used, not for royal residences, but for different purposes. He did not grudge any rewards which might be given to the families of those who had done service to the State, but they might be rewarded in a better way than by apartments in the Royal Palaces. They would be more benefited by a money grant. When distinguished strangers came to this country we ought to have palaces for their reception, but now the only place they had to go to was an hotel. St. James's, Kensington, and Hampton Court Palaces ought to be available for receiving them.—Mr. G. Noel, in reply, said he would take the case of Hampton Court Palace. That palace contained forty-three or forty-four residences or separate apartments, yet the cost of all those residences was only 850*l.* a year. If the views of the hon. member were carried out, and lodgings were provided elsewhere for these ladies, it would be necessary to spend 5,000*l.* or 6,000*l.* a year.—Mr. E. Jenkins said that Hampton Court Palace was not kept in a proper state for a show palace.—The vote was then agreed to, as was also a sum to complete the vote of 2,975*l.* for Marlborough House.——The vote to complete the sum of 113,561*l.* for Royal Parks and Pleasure Gardens was agreed to.——The vote of 26,930*l.* to complete the sum required for the maintenance of the buildings of the Houses of Parliament, was agreed to, an amendment to reduce the vote by 1,750*l.*, the sum put down for the oil-lamps used in the buildings, having been defeated, though nobody seemed to know anything about the lamps for which so respectable a sum was allotted. However, Mr. Gerard Noel, the First Commissioner of Works, promised to look into the matter. —— Votes to complete the sum of 117,255*l.* for the maintenance and repair of public buildings, 15,885*l.* for the furniture of public buildings, 184,334*l.* for the Revenue Department buildings in Great Britain, and 46,750*l.* for County Court buildings, were agreed to.——On the vote to complete the sum of 22,018*l.* for the Metropolitan Police-court buildings, Mr. Whitwell asked why this charge should not fall upon the local rates.—Sir H. Selwin-Ibbetson reminded the hon. member that the metropolitan police-courts were not of a local character like police-courts elsewhere, but belonged, so to speak, to the country at large. All their receipts, which amounted to some 18,000*l.*

a year, were paid into the Imperial Exchequer. ——The vote for completing the sum of 8,203*l.* for Sheriff Court-houses in Scotland was agreed to.——On the vote for completing the sum of 120,300*l.* for the new Courts of Justice, Mr. G. Noel said that the Law Courts were divided into two parts, and that the eastern wing was now finished and ready to be occupied. In answer to further questions, Mr. Noel explained that the west wing ought, according to the terms of the agreement, to be finished in the year 1880. It was, however, at the present time impossible to say whether it would be completed then or not. Many circumstances had arisen to retard the work, the chief ones being the strike movement and the frost. He did not himself look forward to the completion of the building until the year 1881. It was true that the original estimate for the construction of the building was 750,000*l.*, but a second estimate of 826,000*l.* was subsequently made, and he did not think that the latter sum would be exceeded. The vote was agreed to, as was also the vote to complete the sum of 133,500*l.* for the Surveys of the United Kingdom.——On the vote to complete the sum of 20,786*l.* for the Science and Art Department buildings, Mr. G. Noel stated that the cost of the enlargement of a sketch by Sir F. Leighton, P.R.A., for the wall of the library at the South Kensington Museum would be altogether 3,000*l.*, of which sum 800*l.* would have to be paid this year, in the course of which the sketch would be completed. In reply to further questions, Sir H. Selwin-Ibbetson stated that the picture was an allegorical illustration of war, and that it would be well worthy the fame of the artist. The vote was agreed to.——A vote to complete the sum of 4,719*l.* for the British Museum buildings was agreed to.——On the vote to complete the sum of 47,476*l.* for the Natural History Museum, Mr. E. Jenkins objected to the growth of the expense connected with this building, and moved that the vote be reduced by 5,000*l.* The Committee divided, when there appeared, for the reduction of the vote, 10; against, 57; majority against, 47. The vote was agreed to. —— The vote to complete the sum of 20,000*l.* for the University buildings, Edinburgh, was agreed to. On the vote to complete the sum of 17,062*l.* for harbours, &c., under the Board of Trade, Sir G. Balfour wished to know what would be the cost of repairing the damage done to Dover pier by storms.—Mr. J. G. Talbot explained that considerable damage was done to the works at Dover harbour owing to a storm of exceptional violence which occurred on the 1st of January, 1872. The works there were proceeded with gradually, and the money required for them was laid out as it was wanted. — Mr. Whitwell wished to know whether the large additional expenditure about to be incurred for Holyhead harbour was intended for making good special damage or was necessitated by the decay of the works.—Mr. J. G. Talbot said that a breach made in Holyhead harbour by a heavy storm during the late winter had to be repaired. The vote was then agreed to, as were also votes to complete the sum of 198,356*l.* for rates on Government property in Great Britain and Ireland, and to complete the sum of 10,000*l.* for the Metropolitan Fire Brigade. ——The vote to complete the sum of 12,110*l.* for lighthouses abroad was agreed to. ——On the vote to complete the sum of 23,216*l.* for diplomatic and consular buildings, Sir J. Goldsmid complained that no suitable building had been provided for the accommodation of our ambassador at Berlin, and of the excessive cost of the ambassador's palace at Constantinople.—Mr. G. Noel explained that an attempt to purchase a suitable residence for our ambassador at Berlin had fallen through two years ago in consequence of the excessive price asked. The expense of maintaining the Palace at Constantinople was the same as last year.—Mr. Rylands said that the palace at Constantinople was the most expensive property abroad belonging to the British Crown. The cost of the maintenance and repairs of this new building was 750*l.*, exclusive of a salary of 450*l.* per annum paid to the superintendent of works.—Mr. Gerard Noel said that the superintendent to whose salary attention had been called had been maintained at Constantinople because the works required the presence of a first-class man. The works, however, were now complete, and the superintendent was about to be withdrawn, but he would still be retained upon the establishment of the Office of Works, although at a reduced salary. The vote was then agreed to. ——On the 21st inst., on the vote for the Local Government Board, Sir A. Lusk called attention to the unsatisfactory character of the metropolitan water supply, and appealed to the President of the Local Government Board to direct his attention to the matter.—Mr. Sclater-Booth disclaimed being responsible for the public health of London. The Public Health Act did not extend to London. Its administration was conducted by district Boards, under the Metropolis Management Act, with which he had nothing to do. Indeed, there was so much jealousy of the Government action with regard to the public health of London that when he proposed to place the district Boards under the Public Health Act, members representing metropolitan constituencies obstructed the passing of the measure. The water supplied to the west end of London, and indeed all water coming from the Thames, was more or less unsatisfactory; but he believed the statements on that subject had been exaggerated; nine-tenths of the scandalous cases of polluted water originated in the filthy state of the cisterns; and, upon the whole, London was not badly supplied with water. Under the slow but gradual and real operation of the Thames Conservancy Act, the supply was now purer than it had been. The sewage of Oxford and Reading and other towns had from time to time been diverted and purified, and none of it now flowed into the Thames. ——On the vote to complete the sum of 63,665*l.* for the Mint, Sir A. Lusk expressed the hope that steps would be taken to erect the new Mint on the Victoria Embankment with as little delay as possible.—Sir H. Selwin-Ibbetson, in reply, said that the Treasury had been in continued communication with the Corporation of London for the purpose of acquiring a new site for that establishment, and he could only say that if the hon. baronet would use his influence to advance the negotiations now going on with that object, they would probably see the desired change sooner than it otherwise would occur.

SEWAGE IRRIGATION.

Croydon.—At the last meeting of the Beckenham Local Board, Mr. Pascall moved:—

"That in the opinion of this Board, owing to the prevalent nuisances arising from the Norwood sewage farm, situate in this parish, immediate action should be taken to procure the removal of this nuisance."

He stated that the farm covered an area of 66 acres, and received the sewage of about one-fourth of the entire population of Croydon, and this mass of sullage was poured into the parish of Beckenham, though they had no power to control its management, or to compel the use of proper precautions to prevent it becoming, as it had become, a gigantic nuisance to the whole neighbourhood. The motion was carried.

Edinburgh. — The Works Committee of the City Parochial Board, accompanied by Mr. John Macrae, C.E., on the 18th ult. visited the grounds adjacent to Craiglockhart Poorhouse in reference to a proposal, which has been under consideration, that the sewage of the house should be turned to account for purposes of irrigation. As the result of the inspection which was made, the engineer, we are told, expressed the opinion that there was more than enough of suitable ground to use up all the available sewage; and the matter was left in his hands, with instructions to report as to the practical bearings and the probable financial results of the scheme.

DRAINAGE AND SEWERAGE WORKS.

Darenth Valley.—At a meeting of the Darenth Valley Main Sewerage Board on the 8th inst., a letter was read from the Local Government Board sanctioning the borrowing of a sum of 53,000*l.* for works of sewerage. Mr. Hennell is the engineer.

West Kent.—The Local Government Board, under the provisions of the 243rd section of the Public Health Act, 1875, and the 25th section of the West Kent Main Sewerage Act, 1877, have recommended the Public Works Loan Commissioners to advance the West Kent Main Sewerage Board a loan of 40,000*l.* The tunnelling is making rapid progress. Mr. Petworth has been appointed an inspector of works, at a salary of 2*l.* 10*s.* per week. Messrs. Neave & Son are the contractors.

The Tower High-level Bridge Bill has passed the second reading.

THE NEW BUNHILL BURIAL GROUND, ISLINGTON.

THE attempt to sell the piece of freehold ground situated between Church-street, Essex-road, and Islington-green, and known as the New Bunhill Burial-ground, has caused a considerable amount of agitation amongst some portions of the public residing in the locality, and not for the first time. The object in endeavouring to dispose of the land was that it should be used for building purposes, and to this proposal objection was made on sanitary grounds. The land, which occupies an area of nearly an acre in extent, was for some years used for interments, but closed for this purpose in common with many other burial-grounds within the metropolis when the establishment of suburban cemeteries became general. The property was submitted for sale at the Auction Mart on Friday, the 18th instant, by Messrs. Baker & Sons, when exception was taken as to the legality of selling the land, on the ground that the graves in it had been specially purchased, and belonged to the representatives of those buried there; but in answer to this it was stated that the ground was private property, and that interments took place in it subject to the removal of the remains whenever the land might be converted to other purposes. In reply to the objection that the subsoil was not suitable for building upon, it was stated that buildings had already been erected on certain portions of the land, and that good foundations were possible. The particulars stated that the site was especially suitable for the erection of model dwellings, workshops, stables, or other business purposes. It also transpired that the present owners are a Model Dwellings Company, and that the sale was by direction of the first mortgagee. On the land being offered, 1,000*l.* was the first bid, and 1,740*l.* being the highest sum offered the property was bought in.

UNINHABITABLE HOUSES IN HOLBORN.

THE Holborn Board of Works have resolved to deal in a summary manner with a number of dwellings in that district which are not fit to live in. A short time ago Mr. Isaacs, the surveyor to the Board, presented a report to the effect that certain properties in the district should be dealt with under the provisions of the Artisans' Dwellings Act of 1868. These properties included a number of houses in Baldwin's-gardens and Dorrington-street, which the surveyor stated were unfit for human habitation, and ought to be demolished. The report also stated that there were other houses in Dorrington-street, Fullwood's-rents, and Feathers-court, which were likewise in a condition dangerous to health, but he considered that they could be rendered fit for human habitation by the execution of certain repairs, which he specified in detail. At their last meeting, the Board considered this report, and also a letter which had been received from Messrs. Vigers, surveyors, stating, on behalf of the freeholder of the houses in Dorrington-street, that he was prepared to clear the site if the Board would assist him in getting rid of the tenants. On the surveyor to the Board being appealed to with reference to this letter, he said the course he would recommend the Board to adopt was to order the immediate demolition of No. 1, and No. 2 would most assuredly follow. After some discussion, the Board passed a resolution for the immediate demolition of the houses in Baldwin's-gardens and Fullwood's-rents, and also decided to act upon the surveyor's suggestion with reference to the houses in Dorrington-street. As to the houses in Feathers-court, the Board agreed to allow the lessee two months in which to execute the necessary repairs.

Victoria (Philosophical) Institute.—At a meeting of this Society, held on Monday evening, a paper was read by Mr. Robt. Brown, jun., F.S.A., on "The Religion of Zoroaster considered in connexion with Archaic Monotheism." Mr. Brown reviewed the principal features in the system of Zoroaster, and the connexion and parallelism between the early beliefs of Iranian and Aryan Indian. Noticing the original unity of religious conception amongst the Aryan Family of Mankind, he deduced from the above and other considerations various arguments in favour of the existence of a primitive monotheism.

THE BRITISH ARCHÆOLOGICAL ASSOCIATION.

THE ninth meeting of the Session was held on the 16th inst. Mr. Syer Cuming, F.S.A. Scot., in the chair.

Mr. G. Wright, F.S.A., detailed the progress of the arrangements for holding the Congress at Great Yarmouth, and read the programme of places to be visited. Mr. J. Brent, F.S.A., described a cup of Castor ware which had been recently found at the Pan Rock, Whitstable, a site which has hitherto only yielded Samian ware, affording evidence that this remarkable spot was a storing-place for the Roman pottery, and not a manufactory. He exhibited also several bronze celts from Canterbury, &c. In the discussion which followed with respect to the prehistoric character of some of the articles, the Chairman referred to the numerous prehistoric relics found near London-wall. Mr. Myers, F.S.A., exhibited a large collection of terra-cotta objects collected by him in Asia Minor and Africa, including a photograph of a remarkable aqueduct at Algiers, of early Arabic date, recently destroyed to make way for gas-works. He was followed by the Rev. Mr. Maynard, who produced an interesting series of very early articles from Cyprus, among which were some of Egyptian date and style. Mr. Loftus Brock, F.S.A., exhibited a fragment of Gothic tracery-work in stone, blackened by smoke, probably the result of the Great Fire of 1666. It was found in some recent excavations at London-wall.

The first paper was by the chairman, and had for its subject the seasonable one of "Easter Eggs." After referring to the derivation of the name "Easter" from the Teuton goddess, who was represented with eggs on her head, he traced the uses of eggs by many early peoples and races. In Christian times the Copts suspended them from the roofs of their churches. They were found in terra cotta in Etruscan tombs. In England they were supposed to preserve the owners from mischief. In early times there was abundance of evidence that they were worshipped by the Celts, and a remarkable custom still extant in Brittany was dwelt upon. Several examples of much interest were exhibited; one with the emblems of Astarte and of Christ; another of iron, of Russian origin, with representation of the Ascension; and a third of Kentish origin, which had been decorated gaily in colours.

The second paper was by Mr. C. W. Dymond, C.E., who described with great minuteness the present condition of the Hurlens in Cornwall, and the two other supporting circles, — there being three in all. The paper was illustrated by an elaborate plan, which will appear in the "Journal," showing the position of all the stones which now exist, and their relation to each other.

FIRE BRIGADES AT HOME AND ABROAD.

IN the course of a long and interesting account of the Manchester Fire Brigade organisation, the local *Courier* compares the English fire-extinguishing systems and those at present adopted by other nations. The Parisian Fire Brigade consists of nearly 1,500 men, and annually costs about 1,150,000 f. It is conducted upon military principles. In Germany the brigades are semi-military, and some are organised, as they were once in England, from men in the building trades. The Russian and Turkish brigades are conducted on a military basis. Recently the Constantinople brigade was re-organised by an Austrian, and a much better state of things now exists. In China the brigades take flags and coloured lanterns to fires, and are accompanied by bands of music. As in Turkey, the engines, which weigh only about a hundredweight, are carried on the shoulders of four firemen. The Japanese have taken a strange though an effectual course to prevent fires. Every one in whose house a fire originates, accidental or otherwise, is decapitated, and it is stated that fires are seldom heard of in Japan. The brigades of America are very expert. Their telegraphic arrangements are novel, and remarkably complete. Posts are fixed in various parts of the cities, in which there is a telegraph instrument, and it is only necessary to touch a knob, when notice is given to the nearest fire-station that the block of buildings opposite the post is on fire. At the fire-station the men are dressed and the horses harnessed, always ready, with the engine in the yard. We are told that the telegraph instrument when set to work opens the stable-door and lets loose the horses, which fall in on each side of the engine! The men run out of their quarters, attach the horses to the engine, and are on their road to the fire in from fifteen to twenty seconds. This cannot be equalled in Great Britain with the existing arrangements. The quickest time in which the Manchester Fire Brigade can do the same thing is fifty-four seconds, but in this time the horses are harnessed and led from the stables.

The following is the cost of the principal fire brigades of the world:—Boston (U.S.), 97,000*l.*; Chicago, 95,000*l.*; Cincinnati, 54,000*l.*; London, 80,000*l.*; New York, 249,000*l.*; Paris, 100,000*l.*; Philadelphia, 96,000*l.*; St. Louis, 58,000*l.*; San Francisco, 52,000*l.*; Manchester, 6,000*l.*; Liverpool (a portion), 4,000*l.*; Brussels, 7,000*l.*

SANITARY SHORTCOMINGS.

"Dairy Farms" near Glasgow.—Dr. J. B. Russell, Medical Officer of Glasgow, in an appendix to a recent report to the Health Committee of the Police Board, gives an account of a visit he made to the farm of Barraston, in the parish of Baldernock, to investigate a case of enteric fever. No evidence, he states, was got that milk was sent to Glasgow from the farm, but on the 24th ult. he sent the Food Inspector to investigate on the spot. The inspector's report disclosed a state of matters at this farm as bad as could well be conceived. On the 2nd inst. Dr. Russell received information which led him to visit Barraston. Describing what he saw and ascertained, he says:—

"A convenience is being fitted up against the gable of the end cottage in the row, at the foot of the bed, and close to the fireplace, the heat of which will greatly facilitate the transpiration of effluvia into the cottage. There is no paving or surface drainage about the farmyard. The position of the manure-pit, which originally was close to the gable of the house, had been altered also, but the pit, not having been levelled up with earth, was full of foul liquid. The house contains four small apartments, the flooring of which was either stone and bricks or earth. There were six inmates. On the left of the entrance the girl now ill of enteric fever lay; to the right was the kitchen, in the middle of which stood the 'lappering-tub,' containing some twenty gallons of milk, covered with a loose lid, placed there to facilitate fermentation with the heat. Looking to the back were also two apartments,—that to the left being the milk-house, in which was a bed in nightly use, while that to the right opened off the kitchen. The mother was the only female adult, and consequently nurse, housekeeper, and dairymaid all in one. The cows were seven in number, but only one was in milk. Although there is water everywhere about these houses there is not a drop to drink. It is impregnated with iron, and otherwise unpalatable; consequently all the water is brought from a distance of 250 to 300 yards from a considerably higher level."

Dr. Russell further states, that

"On the roadside, in a dry and airy situation, there is a row of probably ten houses whose inhabitants derive their water from the same source. I found in each of three of these houses a case of enteric fever, ranging from three weeks to one week ill, and all of the most decided type."

A state of things more eminently calculated to spread disease could not be conceived. We see that the tenants have been "warned" that no milk from the "farm" must be sent to Glasgow,—and it is to be hoped that none of it will be sent elsewhere under the existing condition of the premises.

New Buildings at Gravesend.—At the Gravesend Petty Sessions, the other day, a builder, named Dennis, was summoned for non-compliance with the requirements of the by-laws in reference to the erection of some new houses in Prospect-fields. Mr. John Gould, the borough surveyor, deposed to the causes of complaint chiefly having reference to the drainage, ventilation, and the situation of the dustbin, which was inside the building, and immediately under the cistern. The inhabitants of these houses would have but a poor "prospect" of enjoying good health.

The Report of the Council of the Royal Institute of Architects, to be read at the annual meeting on Monday, the 5th of May, will show that "the ordinary income of the Institute for the year 1878, including arrears and excluding subscriptions paid in advance, amounted to 2,201*l.* 3s. 11d.; while the expenditure, including the outstanding accounts (352*l.* 18s. 3d.) for the year 1878, amounted to 1,837*l.* 15s. 4d. Thus the ordinary income for the year has exceeded the ordinary expenditure to the amount of 363*l.* 8s. 7d., and the state of the receipts about the beginning of the official year 1878-9 encouraged the Council to devote a sum of 500*l.* to the purchase of 3 per cent. Consols as an addition to the invested capital of the Institute."

MASTERS AND MEN.

Birmingham. — The Birmingham Trades' Council have drawn up a series of suggestions for the establishment of a federation of the Trades' Councils of the Midland Counties. One of the suggested principles upon which the federation is proposed to be based is that arbitration shall be attempted by all the branches of the federation before resorting to a strike or lock-out.

Staffordshire.—The strike in the Staffordshire horse-nail trade against a proposed reduction of 3d. per day terminated on Monday, after six weeks' duration, by the masters agreeing to withdraw the notice and pay the old rate of wages,—viz., 3s. 3d.

Glasgow.—The Operative Bricklayers' Association for Scotland, including the Glasgow and Paisley districts, have agreed, two months before the time, in consequence of the dull state of trade, that their wages should be reduced 1d. per hour, so that the wages will be 7d. from the present time up till the 1st of June next year.

Edinburgh.—The committee appointed by the master joiners of Edinburgh and Leith having met with reference to the proposal of the workmen to submit to arbitration the question of the proposed reduction of their wages, have, it is stated, resolved to adhere to the resolution passed at their general meeting,—*i.e.*, to reduce the wages to 6½d. per hour.

Dover.—The master builders of Dover, Folkestone, Canterbury, Deal, and Walmer, have formed an association for the mutual protection of the masters to meet the combinations of workmen against their employers. Mr. Stiff was elected president of the association, and Mr. W. J. Adcock, secretary; and a committee of twelve was also appointed.

The Durham Colliers.—In the ballot taken on Saturday last among the Durham miners for or against the adoption of the masters' proposition to close the strike, 222 votes were given in favour of the masters' terms and 21,089 against, —showing the immense majority of 20,867 against the proposed terms.

NEW RAILWAY STATIONS.

Manchester.—The new Central Station, Manchester, is making progress towards completion. The site covers an area of 10 acres, and some 5 acres more will be taken up by the approaches and necessary works between the entrance to the station and Deansgate. The thoroughfares forming the boundaries of the station proper are Windmill-street, Lower Mosley-street, Watson-street, and Great Bridgewater-street. The front entrance will be in Windmill-street end, the station being set back from the street line some 120 ft. The frontage to Windmill-street will be about 250 ft. in length, and the length of the station covered by the roof will be upwards of 500 ft. The substructure consists of fifteen arches of 30 ft. span each, which may probably be utilised in the future as a goods depôt. The roof will be in a single span of 210 ft. It is expected that the station will be ready for use before the close of the year.——The works in connexion with the extension of the London-road Station, undertaken by the London and North-Western Railway, commenced a year ago, will, it is hoped, be completed about Christmas. As a result the station will be extended by an addition equal to about two-thirds of its present area. A fence wall, 10 ft. high, bounds the station on the north side of the new street continuing Fairfield-street in a direct line to a point opposite Granby-row, in London-road. As early as possible this new street will be thrown open, and then Birmingham-street will become a thing of the past, for it will be covered by the station buildings. A great deal of low-class and other property has been demolished for the purposes of the extension. The streets so effaced are Swarbrick-street, Ashton-street, Chadwick-street, Holbrook-street, Till-street, part of Worsley-street, and part of Boardman-street. The courts similarly dealt with were Ousey's-court, Chadwick's-court, and Latticoo-court. Messrs. Robert Neill & Sons are the contractors for carrying out the works.

Queensbury.—Another step towards the completion of the Halifax and Thornton Railway has been taken by the opening of a temporary station at Hole Bottom, for the benefit of the inhabitants of Queensbury. The structure is of wood. The signals and points have been fitted

up by Messrs. Saxby & Farmer. The whole work has been done by the workmen of the company, under the superintendence of Mr. Kell, of the engineering staff of the Great Northern Railway Company.

THEATRES.

London.—The Garrick Theatre in Goodman's-fields will shortly be re-opened, after reconstruction and decoration. The theatre claims lineal descent from the house in which Garrick made his first appearance on the London stage. The vicissitudes of the theatres which have stood on this spot were recounted in the *Builder* for 1876 (vol. xxxiv., p. 1239), when a view and historical account of Garrick's villa at Hampton were given.——There is some talk of erecting a new theatre in the Strand for Mr. Toole, on the site of Exeter Hall, which it is proposed to demolish. Negotiations which are stated to have been in progress for the acquisition of that very advantageous site (which is bounded by streets on three of its four sides) are reported to have been impeded chiefly by the onerous condition of demolishing and rebuilding the adjacent houses,—a large new hotel being (according to the *Daily News*) part of the scheme. Exeter Hall was built just half a century ago from the designs of Mr. Dering. In the *Builder* for 1850 (vol. viii., p. 583) we gave an illustrated account of the alterations which were made in the roof, under the direction of Mr. S. W. Daukes, architect, with the view of improving the Hall as a music-room. Mr. Hollingshead estimates the number of London theatres at fifty; but of these some are theatres only by courtesy. The increase in the number of London theatres of late is remarkable,—the Court Theatre, the Criterion, the Duke's, the Elephant and Castle, the Folly, the Gaiety, the Globe, the Opéra Comique, the Park, the Queen's, the Vaudeville, the Aquarium (now called the "Imperial"), and the Royal Amphitheatre, Holborn, have all been built within the last twelve years. The Queen's, however, has now passed out of the list, having been purchased by the Clergy Co-operative Stores Association. We have already mentioned the formation of a company for building a new theatre in Leicester-square, to be called the "Alcazar." Mr. Edward L. Paraire is the architect of this proposed theatre, and has received instructions to clear the site.

Glasgow.—It is reported that arrangements have just been made for the erection of a new theatre in Glasgow, at the north-east corner of Sauchiehall-street and Renfield-street, by the Central Halls Company (Limited), at a cost of about 60,000*l.* The theatre is intended to accommodate some 2,000 persons. The façade to Sauchiehall-street will be in what is called the "Franco-Italian" style.

MARKET BUILDINGS.

Todmorden.—Mr. John Fielden, of Dobroyd Castle, chairman of the Local Board, has laid the corner-stone of a new covered market at Todmorden. The site of the structure is on the old market ground. It will be 123 ft. long, and 81 ft. 6 in. wide at one end, and 76 ft. 6 in. at the other. It will have three entrances, and Yorkshire stone will be used in its erection. The plans have been prepared by Mr. Rodley, the Board's surveyor, who will superintend the carrying out of the work. The market will have eighteen lock-up shops on three sides, and the vacant area will be taken up by stalls; the height of the building to the spring of the roof will be 20 ft. The cost is estimated at 3,500*l.*

Dublin.—The contract for the works in connexion with the South City Markets project has been taken by Mr. Thorpe, of Leeds. With its environment of shops and warehouses, the market will cover the whole central block bounded by Exchequer-street on the north, Fade-street on the south, Great George's-street on the west, and Drury-lane on the east. The great market-hall will occupy the central portion of the site. It will have an area of 5,360 superficial yards, and will be surrounded internally by fifty-four shops. The front elevation of the pile will be in Great George's-street, and will be 370 ft. in length, and four stories high.

Nottingham.—The Bridge Committee of the Corporation of Nottingham last week visited the East Croft, for the purpose of inspecting the new premises which have been built under their direction and let on lease to the Nottingham Hide, Skin, and Fat Market Company, Limited. The new premises are situated in close proximity to the Sanitary Wharf, and in the neighbourhood of what will be, it is expected, some day or other, the Cattle-market. The offices on the lower floor include rooms for the secretary, clerks, &c.; and on the floor above are the sale and board room, the whole being fitted with hot-water arrangements and other appliances, furnished by Messrs. Clifford & Sons. The ground occupied by the building is 40 yards square, and externally the structure is in the Gothic style, freely treated, the Whitwick Colliery Company's terra-cotta bricks being used for ornamental work. In the interior the aim of the architect, Mr. S. Dutton Walker, has been to provide in the best possible way for the business to be carried on. The works have been carried out by Messrs. Lees Bros.

HALLS.

Harborne.—A company has been formed for the purpose of erecting a Masonic hall at Harborne. They propose to start with a capital of 5,000*l.*, in 25*l.* shares.

Southampton.—The corner-stone of the new Masonic hall in course of erection in Albion-place, Southampton, has been laid. The hall is to be in the Italian style, freely treated. The principal elevation faces Albion-place, and is 50 ft. in length; the side elevations, facing the Forest View roadway, extend about 73 ft. There will be an ante-room or Chapter-room, 26 ft. 4 in. by 18 ft. 9 in., with a height of 11 ft., its bay-windows overlooking the Western Shore. The lodge-room will be 45 ft. by 30 ft. and 18 ft. high, and will be lighted by two lanterns from the roof. There will be a banqueting-room, facing Albion-terrace, 38 ft. 6 in. by 25 ft., also 18 ft. high, together with a kitchen, washhouse, pantry, and serving-passage. On the one-pair floor, over the ante-room, will be four rooms, and other accommodation for the lodge-keeper. The material used is to be white brick in all the exposed parts, with dressings partly in moulded brick, and of stone to the architraves and pediments. The roofs will be slated and tile-capped. The architect is Mr. J. G. Poole, and the builder Mr. S. Stevens.

WATER SUPPLY.

Tamworth.—The Tamworth Rural and Urban Sanitary Authorities have accepted the tender of Mr. Joseph Bennett, of Northampton, amounting to 977*l.* 2s. 7d., for sinking the pumping-shaft and erecting the pumping-station at Hopwas. Mr. Henry Marten, C.E., of Wolverhampton, is the engineer in charge of the operations. Mr. Samuel Spruce, C.E., a member of the Rural Authority, was thanked for his assistance in maturing the scheme of water-supply.

Burnley.—In a tube-well which Messrs. Le Grand & Sutcliff, of London, are just completing, at Messrs. Brown & Astley's brewery, Nelson, near Burnley, they have tapped an artesian spring, at 155 ft. deep. The spring is stated to rise to the height of 37 ft. above the surface, and as it is increasing in strength daily, it is expected it will shortly flow over into the tank of the brewery, which is 41 ft. above the surface.

THE LARGEST STONE IN ENGLAND.

Probably the largest detached stone in England is to be seen on the north side of the Yorkshire hills, about eight miles south of Whitby, and about one mile from the sea-coast. I found, on measurement, this square block of solid freestone to contain 350 cubic yards. It fell last summer from the adjoining high cliff. There are others of immense size, but this is the largest. John Kipling.

WOOD ROOFS.

Sir,—Will any reader kindly inform me the following:—After having ascertained the strains on the various parts of a roof-truss, how am I to get the scantlings of the various parts in a wooden roof to bear the strains? I should like a reliable formula. Nil Desperandum.

The Artists' Volunteer Corps.—The 38th Middlesex Rifle Volunteers will give an "Assault of Arms" on (this) Saturday evening, at St. George's Hall, Langham-place.

KENILWORTH SEWERAGE COMPETITION.

Sir,—In reply to the advertisement which appeared in your columns some months ago, in which the Kenilworth Local Board offered two premiums for schemes for sewering and disposal of the sewage of their district, I see by a local paper that a committee of five members of the Board examined about twenty sets of plans sent in, and have awarded the premiums. I have nothing to say as to the merits or demerits of the selected schemes; but I should like to know from you or your numerous readers whether it is customary for Boards to make awards in such cases without the assistance of a professional man, as was done in this case. I am also informed that the plans have been kept from view, both of ratepayers and competitors. Is this right, or a general rule? If men having no knowledge of the subject are to be the judges in these affairs, I hope and trust that the day is not far distant when no engineer will enter any competition. An Old Subscriber.

WEYMOUTH DRAINAGE.

Sir,—I have observed a letter in the *Builder* of the 19th inst., signed "Q.," in which certain statements are made with reference to the drainage of Weymouth, which, if uncontradicted, are calculated to create wrong impressions.

Without entering upon the merits of the legal proceedings to which "Q." refers, I should like to be allowed to correct a few of the errors into which he has fallen, probably in ignorance of the facts, and with no desire to misrepresent the true condition of affairs.

I may mention that in the year 1871 Sir John Coode, who, as engineer to Portland breakwater, had an intimate personal acquaintance with Weymouth, was asked by the Local Board to report to them upon the best means of disposing of the sewage of the borough. This he did, and recommended that all cesspools should be abolished and filled up, and that the sewage should be conveyed to one spot, which he indicated, through a series of intercepting sewers, and there pumped and utilised in irrigating land at a suitable distance from the town. These proposals were sanctioned by the Board, but it was afterwards found impracticable to obtain land upon reasonable terms for the formation of a sewage farm, and a precipitation process was put forward in lieu of it. In each case, be it observed, the sewage was to have been entirely excluded from the harbour and breakwater. In the mean time the contracts were let for the sewers, and the pipes laid upon the basis sketched in Sir John Coode's original report. At this date several systems of precipitation and other modes of treating town sewage were being experimentally tried by different municipal authorities, and as the Weymouth Board were unwilling to embark in these costly trials, or to believe in the El Dorado held out by numerous patentees, they decided to wait, at all events for a time, until some plan had been devised by which the manurial properties in the sewage could be satisfactorily utilised upon the most advantageous terms, it being then considered that some desideratum of the kind was within the bounds of possibility. As the sewage had to be discharged somewhere until a decision had been arrived at with regard to its ultimate disposal, it was determined by the Board to allow it to run into the harbour, through which there is a strong current, due to tidal action. This course, which was admittedly a temporary expedient, has been in operation up to this time, the local authorities being satisfied with the results; and although there may be some difference of opinion as to the wisdom of allowing this outlet for the sewage to be perpetuated indefinitely, there can be no question as to the general soundness of the course which the Board adopted, seeing that they are now in a position to couple up the outfalls of their sewers, and to concentrate and pump, either for conveying to sea or for precipitation, as may be decided upon for the *permanent* disposal of the sewage.

It is not a fact, therefore, that the system of drainage which has been adopted, or any material portion of that system, will have to be rearranged should the Board determine to withdraw the sewage from the harbour, seeing that what has been done will form so many links in the complete system, and will be fully utilised.

It will be apparent from the above that the exclusion of the sewage from the harbour has been regarded from the first as being the proper *permanent* course to adopt, although a considerable annual saving to the ratepayers is effected as long as the present means of discharge are maintained, which obviate the necessity for heavy pumping charges as well as the outlay required for the construction and maintenance

of further works. The cost of the drainage system already executed has been less than 10,000*l*., and not 30,000*l*., as stated in the letter which appeared in your issue of the 19th inst. A further sum of about 13,000*l*. was expended in the construction of a dam across the back-water, with the object of submerging the mud banks, but this cannot be considered as forming a part of the drainage scheme.

I gather from the medical returns that the health of the town was never so satisfactory as it has been since the new sewers have been laid.

RADIPOLE.

CHURCH-BUILDING NEWS.

Holyhead.—The parish church of Holyhead (St. Cybi's) was reopened on the 4th inst., after restoration, which, it is stated, is mainly due to the efforts of the Hon. W. O. Stanley, who offered to contribute 3,000*l*., on condition that a sum of 2,000*l*. would be raised to meet it, thus making a total of 5,000*l*., which was the estimate given by the late Sir Gilbert Scott as the amount required to complete the restoration. It was, however, found that the old oak roof had to be entirely renewed, which would entail an additional expense of 1,000*l*. The Hon. W. O. Stanley very generously added a further donation of 1,000*l*. to that already made, and nearly 2,000*l*. were subscribed from other sources.

Worcester.—St. Helen's Church, Worcester, is being restored. The whole of the south aisle wall has been pulled down, the stone being found in an extremely decayed state. It is to be entirely renewed, as also will be the north and south aisle roofs. The nave and chancel-roof are to be stripped and restored with oak boarding. The flooring will be relaid with encaustic tiles, the old monumental stones remaining in their original places. New seats are also to be provided when funds permit. The old tower arch is to be opened and the vestry space added to the body of the church. A new vestry will be provided at the east end of the building. The contractor is Mr. Thomas Collins, Tewkesbury, and the architect Mr. Aston Webb, London.

Norwich.—The committee for restoring St. Peter's Mancroft Church, Norwich, have resolved to consult Mr. Street as to the extent of restoration necessary, and as to what portions of the fabric require immediate attention.

Buckland.—The vicar and churchwardens of Buckland, near Dover, appeal for funds for the restoration and enlargement of the parish church. The church is partly Norman, and partly Decorated; and Mr. Butterfield has undertaken the work of enlargement, which is estimated to cost 3,500*l*.

Aston.—Lord Leigh has consented to lay the foundation-stone of the extension of the nave and aisles of Aston parish church, Birmingham. The committee who have undertaken the enlargement and restoration of the church propose to carry out the work in sections. The first section comprises the extension of the nave and aisles, and necessitates the preparation of the ground north and south of the chancel, as well as the removal of the chancel itself, which will, however, be re-erected at the east end of the south aisle, forming a south aisle to the new chancel. This first section of the work when completed will give about 500 additional sittings. No attempt will be made to renovate the mural monuments, which will be carefully removed and replaced on the walls of the old chancel when that is re-erected. The other monuments and tombs at present inside the chancel will be packed in separate boxes and removed to a place of security during the progress of the work, and will eventually be replaced in the old chancel. The oldest and most interesting of these monuments, viz., the stone figures of the Arden family, of the time, it is thought, of Richard I., and those of the Erdingtons, of the reign of Henry VI., have been removed from the positions which they originally occupied in the north and south aisles respectively.

A Church Struck by Lightning.—During the afternoon of the 15th inst. the tower of Henlow parish church, Bedfordshire, was struck by lightning. The electric fluid passed down the interior of the tower, rending and tearing it; then took its course through the body of the church, cutting up the woodwork of the seats into splinters, and made its exit through a window in the east end, which it knocked about sadly.

SCHOOL BUILDING NEWS.

Salford.—On Easter Monday Mr. Oliver Heywood laid the foundation-stone of new day and Sunday schools in connexion with St. Stephen's Parish Church, Salford. The new buildings will be in the Gothic style, of brick, with stone dressings. There will be two floors. On the lower will be a girls' schoolroom, 60 ft. long and 30 ft. wide; and on the upper a room of similar dimensions for boys. Each will have two class-rooms and a separate entrance. The architect is Mr. H. Lord, of Manchester, and Mr. W. Brown, of Salford, is the builder.

Maidstone.—A stone building, intended to be used as a Sunday-school and parish-room, is in course of erection on the north side of St. Peter's Church, Maidstone. The plans were prepared by Mr. Hubert Bensted, architect, and the contract has been taken by Messrs. Clements & Wallis, builders, at 578*l*.

Armagh.—The new Mall National School, Armagh, adjoins the Presbyterian Church, and has been erected from plans prepared by Mr. Fullerton, architect.

VARIORUM.

THE "Manual for Overseers, Assistant Overseers, Collectors of Poor-rates, and Vestry Clerks," by Hugh Owen, jun., Barrister-at-Law (Knight & Co.), has taken its place as a valuable handbook for all these officers. We have only to mention, therefore, on the present occasion that a new edition (the fourth) has been issued. In the appendix, forms of parish books and accounts are given.——The *Family Magazine* points to a new employment for women:—"Another field for amateur artists opens in the new fashion of painting bands for trimming dresses of rich materials. This is an American 'notion,' and one which finds favour in Paris. I have seen most successful results, the flowers represented being painted with the truest regard to Nature. A magnificent specimen consisted of a cream satin dress, trimmed with cream velvet bands portraying brilliant humming-birds, painted by hand. Black satin bands painted with butterflies also formed another beautiful trimming; in fact, it is impossible to foretell how far this hand-painting may be carried in embellishing ladies' dresses. It is no longer possible to say that *this* is fashion, and *that* is not fashion; for almost everything is fashion that can be gracefully or picturesquely adapted to the time or the occasion." —— In a sketch of the rise of the steam-engine in the April number of "Great Industries of Great Britain," the writer says,—"And now occurred that incident which nobody who describes the steam-engine ever fails to relate, of the boy who immortalised himself by laziness. His duty was to turn the cock which let the steam in at the bottom of the cylinder, and the one which let the cold water in at the top, each at its proper nick of time, or otherwise the engine would dash itself to pieces. It occurred to him to make the valves open and shut themselves by tying their handles with lengths of string to the moving beam overhead, so that he might play while the engine worked. Thus was invented the *scoggan*, from the North-country verb to *scog* or sulk; and the name of Humphrey Potter went down to posterity with those of Newcomen and Watt." It is surely unjust, however, to say Potter immortalised himself "by laziness." It was ready wit and ingenuity that enabled him to do what he did, though desire to escape a monotonous drudgery set him thinking how it was to be done.——We take from the current number of "Our Own Country," a reminder of Burghley House:—"The old ball-room, or second billiard-room, is our next stage in the journey over Burghley House. The walls and ceilings are painted by Laguerre, who divides with Verrio the questionable glory of having covered vast expanses of ceiling and wall in this mansion with attitudinising gods, goddesses, demi-gods, nymphs, and heroes. They sprawl, as Walpole says, all over 'those public surfaces on which the eye never rests long enough to criticise, and where one would be sorry to place the works of a better master.' This is truly one sort of excuse for art of the conventionally meretricious order. In the brown drawing-room we find more of the beautiful limewood carvings of birds, flowers, and fruit, by Gibbons, over the chimneypiece. Some excellent pictures are in this room: a higly curious example of Hugo van der Goes, the 'Life of St. Augustine,' in divisions, being one of the most notable. The central compartment of this work represents the installation of Augustine as Archbishop of Africa. A China dish, with a view of Burghley and the date, 1745, painted thereon, is one of the objects in this room. Next is the black and yellow bedchamber, hung with tapestry, and containing a state-bed of great age. Here, too, the Gibbons carving recurs; and the chamber, with its adjacent dressing-rooms, contains pictures decidedly worth notice. Another bedroom, nearly square and of good size, is designated 'Queen Elizabeth's Chamber.' It is doubted, however, whether the maiden queen ever visited Burghley, albeit there is a chair in the chapel also called after her, and certain spots in the park are identified with her name. The bedroom furniture may have been brought from Lord Burghley's house in Stamford, where Elizabeth certainly was entertained, as appears from a distinct and precise entry in the Lord Treasurer's diary, under the date of August 5th, 1566. It is further evidenced that a fever in the house at Burghley,—then the old house,—prevented Elizabeth from going thither at that time, and there is no record of her having visited the place at any other period. It was after a stay at Theobalds that the queen made her famous speech to her old Minister, saying that his head and her purse could do anything; and it was at Theobalds that those royal entertainments, which cost Burghley 2,000*l*. and 3,000*l*. each were given. The tapestry of 'Queen Elizabeth's Bedroom,' so called at Burghley, could never have been seen by her, at all events, since it was made, probably at Mortlake, for the fifth Earl of Exeter. The subjects are the story of Actæon, Bacchus and Ariadne, and Acis and Galatea. Among the pictures Bassano's fine composition, 'The Agony in the Garden,' is decidedly the best."

Miscellanea.

Marylebone.—Dr. Whitmore, in his last monthly report, justly complains that Marylebone has no appropriate building in which the coroner's court can be held. "The present system of holding inquests at public-houses is in all respects highly objectionable, a fact which very many other parishes in London are fully conscious of, inasmuch as they have already erected buildings especially adapted to the purpose of holding inquests. Some few years ago this matter was fully gone into by the Sanitary Committee, and there was a general feeling that a building or buildings, placed in close proximity to each other, which should comprise a mortuary-house, a post-mortem house, and a coroner's court-house, ought to be erected. Indeed, a site,—peculiarly appropriate,—was selected, but, for reasons which I need not more particularly refer to, it could not be obtained. There are, on an average, about 220 inquests held annually in this parish, and that fact alone should suffice to show the necessity of having an appropriate place to hold them in. If St. Marylebone waits but a few years longer, it will be about the last of all the metropolitan parishes to do that which, for sanitary and other scarcely less important reasons, ought to be done at once."

Pictures in Paris.—The Salon of 1879 will open on May 12th, nearly two weeks later than usual. The jury for the admission of pictures is already at work in the halls above. As readers of the *Builder* have already been informed, there has been a vital change in the election of the jury this year. Hitherto only those artists who had received medals were allowed to vote. The administration this year extended the right to vote to all artists who have been accepted three times. As usual, MM. Bounat, Bouguereau, Cabanel, Laurens, Lefebvre, &c., have been re-elected. The jury cannot select more than 1,200 works from the 10,000 submitted to them. Every frame must this year bear a plate indicating the subject of the picture and the name of the artist; this, and an illustrated catalogue containing engravings of the best works, will be the only marked innovations.

Institution of Surveyors.—At the next meeting to be held on Monday evening, the 28th of April, a paper will be read by Dr. W. Allen Sturge, entitled, "The Disposal of the Sewage of Paris, with especial reference to the Sewage Farms of Gennevilliers."

Pneumatic Excavator.—During the construction of the Tay Bridge, considerable difficulty was experienced in sinking the cylinders for the piers. At length, Mr. Reeves, one of the engineers engaged on that great work, succeeded in devising an excavator on the pneumatic principle, by means of which the sand was sucked up from within the cylinders and discharged into hoppers, the cylinders following down the displacement of the sand. One of these excavators, or sand-pumps, as they are also called, has just been completed for the New South Wales Government, and it is to be sent out to Sydney. The apparatus consists of a pair of cast-iron cylinders, 4 ft. in diameter, carried on a staging and placed in connexion at their tops with an air-pump, driven by a small steam-engine. The connexions are so arranged that the air can be exhausted either from one cylinder singly or from both at the same time. The bottoms of the cylinders are connected with a suction-tube 3½ in. in diameter, which leads down to the sand. Here, again, it is so arranged that the cylinders can be worked either singly or in combination by means of self-acting valves. The soil is discharged from each cylinder by a trap-door placed in its front. The engine and air-pump are carried on the same framing, and the whole forms a very compact arrangement. In operation, the engine being started, the air is exhausted from one cylinder; the sand and soil rushing up into the vacuum thus created soon fill the cylinder, the fact being indicated by a tell-tale. The connexion is then made between the air-pump and the second cylinder, and that is similarly filled, during which time the contents of the first cylinder are discharged, and it is ready for the air-pump by the time the second cylinder is full, and so the process continues alternately until the desired end has been attained.

Inhabited House Duty.—An important measure of relief has been granted as regards the incidence of the Inhabited House Duty by the provision that where any houses, being one property, shall be divided into, and let in different tenements, and any of such tenements are occupied solely for the purposes of any trade or business, or of any profession or calling by which the occupier seeks livelihood, or profit, or unoccupied, the person chargeable as occupier of the house shall be at liberty to give notice in writing at any time during the year of the assessment, to the surveyor of taxes for the parish or place in which the house is situated, stating the facts, and the Commissioners acting in the execution of the Acts relating to the inhabited house duties shall, upon proof of the facts to their satisfaction, grant relief from the amount of duty charged in the assessment, so as to confine the same to the duty on the value according to which the house should, in their opinion have been assessed, if it had been a house comprising only the tenements other than such as are occupied as aforesaid or are unoccupied. Also that every house or tenement which is solely occupied for the purpose of any trade or business, or of any profession or calling by which the occupier seeks a livelihood or profit, shall be exempted from the duties by the said Commissioners upon proof of the facts, and exemption shall take effect although a servant or other person may dwell in such house or tenement for protection.

The Northants and Midland Counties Sanitary Association.—At the quarterly meeting of this Association, on the 12th inst., Mr. Taylor, of Witney, read a paper on "Our Water Supplies, Public and Private," dealing with the subject from a sanitary inspector's point of view. An inspector of nuisances should, he said, be armed with a distinct, reliable, and ever-ready acquaintance with the Acts of Parliament which afford to him the power of action. He should fully understand and appreciate the legal difficulties, and have a knowledge as to the various sources of water-supply, and the works necessary for making those supplies available for domestic use. He should also fully understand what constitutes a sufficient supply, and how to prevent its being wrongly used or wasted. Having alluded to the power of the sanitary inspector, if properly exercised, Mr. Taylor stated that because the law now said that an inspector must be appointed, some Boards ground down the remuneration to the lowest ebb, and paid the cheques quarterly as a sort of "black mail," with a tacit understanding that the less the officer did for the money the better the Board would be pleased.

Black Mildew on St. Paul's.—Professor Leidy, at a late meeting of the Philadelphia Academy of Natural Sciences, remarked that his attention had been directed to an article in an English periodical (*Science Gossip*), in which the blackness on some portions of St. Paul's Cathedral is stated to be due, not to the effect of smoke, but mainly to the growth of a hitherto undescribed lichen, which would appear to flourish only on limestone, and in situations unaffected by the direct rays of the sun. Professor Leidy stated, according to the *Times*, that his attention was called many years ago to a similar black appearance on the brick walls and granite work of houses in narrow shaded streets, especially in the vicinity of Delaware River. Noticing a similar blackness on the bricks above the windows of a brewery, from which there was a constant escape of watery vapour in a more central part of the city, he was led to suspect it was of a vegetable nature. On a microscopical examination, the black mildew in this case proved to be an alga, closely allied to a species which he took to be the well-known *Protococcus viridis*, and which gives a bright green colour to the trunks of trees, to fences, and to walls, mostly on their more shaded and northern sides, everywhere about Philadelphia. Probably it may be the same plant in a different state, but until proved to be the same, it may be distinguished as *P. lugubris*. It consists of minute round or oval cells, isolated or in pairs, or in groups of four, the result of division; or it occurs in short irregular chains of four or more cells up to a dozen, occasionally with a lateral offset of two or more cells. By transmitted light the cells appear of a brownish or olive-brownish hue. In mass and to the unassisted eye the alga appears as an intensely black powder. Can this be the gonidial alga of the undescribed lichen of St. Paul's?

The Valuation Bill.—At a meeting of the Essex Chamber of Agriculture, at Chelmsford, Sir T. Fowell Buxton presiding, Mr. W. Lambton Lewis read a paper on the Valuation Bill, and moved,—"That this Chamber, while approving legislation having for its object the more equitable assessment of property, condemns the clauses in the Valuation of Property Bill which fix the arbitrary basis of rent for the gross value, the extensive powers conferred on the surveyor of taxes, and the cumbrous and expensive mode of final appeal." Mr. J. S. Gardiner seconded the resolution. Captain Delf moved, and the Rev. F. A. S. Fane seconded, the following amendment:—"That this Chamber, while approving legislation having for its object the more equitable assessment of property, disapproves the present Valuation of Property Bill, and more especially those clauses which confer extensive powers on the surveyor of taxes, and the cumbrous and expensive mode of final appeal." The amendment was carried. It was also resolved, on the motion of Mr. Holton, seconded by Mr. Courtauld, M.P.,—"That this meeting entirely disapproves the exemption of so much of the tithe from assessment as a clergyman may pay for the services of a curate, proposed in the 85th clause of the Valuation Bill."

Preaching from Afar.—On Easter Sunday a number of gentlemen interested in the microphone and the telephone assembled in the Telegraph Office of the Victoria Railway Station, Manchester, for the purpose of listening, by means of an apparatus designed by Mr. Louis R. Crossley, to the devotional service and sermon at the Square Congregational Chapel at Halifax, Yorkshire,—thirty-six miles away. Mr. Crossley's apparatus, which is called "The Telephone Transmitter," and is a modification of Professor Hughes's microphone, was fixed low down within the pulpit at Halifax, in order not to excite the curiosity of the congregation. Although such a position for the instrument was not what could have been desired, much of the sermon preached by Dr. Mellor, and the whole of the singing and organ music, were heard very distinctly by the small "congregation" at Manchester.

Cleopatra's Needle.—The "Indestructible Paint Company" are about to apply to Cleopatra's Needle, by order of the Metropolitan Board of Works, a coating of their patent enamel solution. It is to be hoped this is being done under proper advice.

Empties.—According to the *Metropolitan*, empty houses at Brighton at the present time represent a rental of 12,000*l.* per annum, and a dormant capital investment of half a million of money.

Art Students' Home.—A home for lady students attending art classes and schools in London has recently been established in a house in Brunswick-square, under the immediate patronage of her Royal Highness the Duchess of Teck and the presidency of Baroness Burdett-Coutts, with a committee of management. The lady resident will communicate with any one desirous of further information.

Oswestry.—Mr. E. Bremner Smith has resigned the office of borough surveyor, which he has held for twelve years, in consequence of the Town Council requiring him to devote his whole time to the duties of the office. The Council have resolved to appoint another surveyor, at a salary of 150*l.* per annum.

A Proposed Mansion.—Negotiations are in progress for the purchase of land at Sunningdale, in Berkshire, for H.S.H. Count Gleichen, upon which it is proposed to build a new residence from the designs of Mr. D. Brandon, F.S.A.

TENDERS

For Wesleyan Chapel, Plaistow. Mr. S. J. Newman, architect. Quantities supplied by the architect:—

Staines & Son	£3,944 0 0
Tibbit	3,750 0 0
Prout	3,700 0 0
Jones & Co.	3,596 0 0
Chapman	3,482 0 0
Hibble	3,478 0 0
W. & H. Castle	3,475 0 0
Parker & Evans	3,460 0 0
Newton & Triggs	3,400 0 0
North, Brothers	3,390 0 0
Thompson	3,378 0 0
Crisp & Tomlin	3,317 0 0
Shapley	3,295 0 0
Raynes	3,255 0 0
Gregar	3,219 0 0
Johnson & Co.	2,993 0 0
Beale	2,894 0 0
Maley	2,250 0 0

For proposed new class-rooms at the Stratford-grove School. Mr. Joseph Rookwood, architect. Quantities supplied by Mr. F. Palmer:—

Reed	£658 0 0
Abraham	624 0 0
Maddison	595 17 6
North, Brothers	590 0 0
Hoskings, Brothers	543 0 0

For alterations and additions (exclusive of old materials), at No. 1, Royal Parade, Chislehurst, Kent, for Mrs. Beaumont. Mr. John Farrar, architect:—

Lack	£217 0 0

For alterations and additions at Nos. 15 and 16, Great Charlotte-street, Blackfriars-road, for Mr. W. T. Purkiss. Mr. Edward Clark, architect:—

Lack	£234 0 0

For the formation of roads, &c., on the Ley Spring Park Estate, Leytonstone, Essex. Messrs. Hammack & Lambert, surveyors:—

Hewett	£8,970 0 0
Maxwell	8,500 0 0
Bloomfield	8,450 0 0
Cardus	8,350 0 0
John Jackson	8,275 0 0
Jesse Jackson	8,000 0 0

For the formation of roads and sewers, on the Springfield Park Estate, West Acton. Messrs. Hammack & Lambert, surveyors:—

Cardus (accepted)	£4,721 0 0

For the formation of roads and sewers on an estate near Bruce-grove, Tottenham. Messrs. Hammack & Lambert, surveyors:—

Bloomfield (accepted)	£1,142 0 0

For the formation of roads, &c., at East Dulwich. Messrs. Hammack & Lambert, surveyors:—

Harris (accepted)	£1,588 0 0

For alterations and additions to Grange-mews, Grange-road, Eastbourne, for Mr. Richard Smith. Mr. Amos Crisford, architect:—

Hounsom & Sons	£920 0 0
Stevens (accepted)	650 0 0

For the erection and completion of a roof over roadway between the Central Meat and Poultry Markets, Smithfield, for the Central Markets Sub-committee of the Corporation of the City of London. Mr. Horace Jones, architect:—

Ashby, Brothers	£2,895 0 0
Browne & Robinson	2,760 0 0
Hook & Oldrey	2,671 0 0
Morter	2,478 0 0
Webster	2,300 0 0
Perry & Son	2,239 0 0
Hart	2,217 0 0
Conder	2,217 0 0
Mowlem	2,195 0 0
Ashby & Horner	2,163 0 0
Holland & Hannen	1,980 0 0

For the drainage of Brecon, for the Brecon Urban Sanitary Authority. Mr. Rhys Davies, surveyor:—

Davies	£10,283 0 0!
Pickthall & Son	9,846 10 0
Backerstone	9,734 0 0
Batchelor	9,100 0 0
Welch	9,056 0 0
Gun	8,771 3 6
Cowbey & Son	8,689 14 8
Jones & Jebson	8,594 0 0
Thomas & Son	8,500 0 0
Dickson	8,260 0 0
Thomas	8,250 0 0
Dodd	7,700 0 0
Mackay	7,389 0 0!

For painting and regilding, &c., the Monument, Fish-street-hill, for the Corporation of the City of London. Mr. Horace Jones, architect:—

Pitman & Cuthbertson	£389 0 0
Hayward	350 0 0
Conder	315 0 0
Macintosh	287 0 0
Taylor & Sons	287 0 0
Smith	279 0 0
Harrison & Wood	274 0 0

For the erection of mast and block workshop, Church-street, Rotherhithe, for Mr. Alexander Chambers. Messrs. E. Thomas & Son, architects:—

Kent	£1,650 0 0
Greenwood	1,555 0 0
Jerrard	1,493 0 0
Almond	1,430 0 0
Salt	1,345 0 0
Bulmer	1,310 0 0

For the erection of a new malting, at Maidenhead, for Mr. W. Nicholson. Mr. George Scamell, architect. Quantities supplied by Messrs. R. L. Curtis & Sons:—

Woodbridge	£5,555 0 0
Morter	5,543 0 0
Cox	5,399 0 0
Silver	5,286 0 0
Brown	4,950 0 0

For Chorlton Union Schools and Homes. Messrs. Mangnall & Littlewood, architects:—

Meadows	£19,180 0 0
Brown	19,023 0 0
Statham & Sons	18,775 0 0
Brown	18,413 0 0
Napier	18,193 0 0
Ward	18,090 0 0
Davies & Maudsley	17,972 0 0
Wilson & Co.	17,770 0 0
Foreman & Todd	17,599 0 0
Southern	17,375 0 0
Neill & Sons	17,306 0 0
Elms & Evans	17,000 0 0
Herd (accepted)	16,924 0 0
Webster	16,560 0 0
Warburton (withdrawn)	15,190 0 0

For a new coffee-house, in Belgrave Gate, Leicester, for the Leicester Coffee-house Company. Mr. E. Burgess, architect. Quantities by Mr. W. Thorncroft:—

Kellett	£3,159 0 0
Hutchinson & Son	3,050 0 0
J. & H. Herbert	2,989 0 0
Brown	2,963 18 0
Major (accepted)	2,943 15 0

For altering and improving premises, Nos. 3 and 4, York-buildings, Hastings, for Messrs. Reeves & Bowerman. Messrs. Cross & Wells, architects:—

Cruttenden	£1,897 0 0
Vidler	1,849 0 0
C. & E. Harman	1,770 0 0
Jenkins	1,660 0 0
Hughes	1,648 0 0
Novis	1,575 15 8

For stabling, &c., and conservatory, at St. Mary's Lodge, West-hill, Hastings, for Mr. S. Stanford. Messrs. Cross & Wells, architects:—

	Stabling.	Conservatory.
Cruttenden	£500 0	£615 0
Wood	495 0	597 0
Vidler	449 0	635 0
Rodda	475 0	589 0
Womersley	448 0	——
Taylor, Brothers	399 15	565 10
C. & E. Harman	436 0	527 0
Brown	——	540 5
W. & F. S. Smith	381 6	485 7
Phillips & Co.	——	481 0
Ditch	376 19	400 0

For two new houses and shops, London-street, Reading, for Mr. W. J. Palmer. Messrs. Brown & Albury, architects:—

Knapp	£1,579 0 0
Searle	1,570 0 0
Higgs	1,549 10 0
Simonds	1,548 0 0
Poffley	1,497 10 0
Denton (accepted)	1,331 10 0

For small villa, at Castle-hill, for Mr. J. W. Palmer. Mr. W. H. Haynes, architect:—

Dungate	£830 0 0
Baker	819 0 0

For repairs to ship's gridiron, Newport, Mon., for the Newport Harbour Commissioners. Mr. E. A. Lansdowne, architect:—

Marrows	£1,234 13 6
Morse	1,097 19 0
Mills	956 0 0
Thomas & Son	930 0 0
Evans & Son	915 0 0
Jones & Son	897 0 0
Firbank (accepted)	840 2 0
Williams	830 0 0

For alterations, additions, and repairs to the Brixton Orphanage. Mr. Alfred Wright, architect:—

Maxwell, Brothers	£910 0 0
Pack, Brothers	805 0 0
Crabb & Son	635 0 0
Marsland	825 0 0
Phelps & Rice	730 0 0

For detached villa, Cavendish-road, Tooting. Mr. Alfred Wright, architect:—

Priestley	£1,188 0 0
Richardson	908 0 0
Newstead	865 0 0
Phelps & Rice	725 0 0

For second pair of model cottages, Hugon-road, Wandsworth Bridge-road. Mr. Alfred Wright, architect:—

Stoner	£687 0 0

For a new house and offices, at Oak-Lea, Wokingham, Berks (including pulling down of present house), for Mr. Edward Nicholson. Mr. W. Ravenscroft, architect. Quantities by Messrs. Cooper & Son:—

Silver & Son	£6,288 10 0
Higgs	6,296 0 0
Rider & Son	6,048 0 0
Woodroffe & Son	6,011 0 0
Staines & Son	5,820 0 0
Jarrett	5,700 0 0
Filewood *	5,723 0 0

* Accepted, subject to a few reductions.

For a lodge and entrance-gates at Oak Lea, Wokingham, Berks, for Mr. Edward Nicholson. Mr. Ravenscroft, architect. Quantities by Messrs. Cooper & Son:—

Rider & Son	£632 0 0
Higgs	624 0 0
Silver & Son	608 0 0
Jarrett	590 0 0
Woodroffe & Son	571 18 0
Staines & Son	566 0 0
Filewood (accepted)	565 0 0

For repairs and alterations to two houses in the Grove, Blackheath, for the Earl of Ashburnham. Mr. Charles Reilly, architect:—

Heeps	£1,639 0 0
Newman	1,394 0 0
Harrison & Wood	1,244 0 0
Gates	1,240 0 0
Jerrard	1,171 0 0
Wenborn	1,060 0 0

The Highways Committee of the Islington Vestry have accepted the tender of the Val de Travers Asphalte Paving Company, Limited, for paving the footways of Highbury New Park with their compressed rock.

CHARGES FOR ADVERTISEMENTS

SITUATIONS VACANT, PARTNERSHIPS, APPRENTICESHIPS TRADE, AND GENERAL ADVERTISEMENTS.

Six lines (about fifty words) or under ..... 4s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

Terms for series of Trade Advertisements, also for Special Advertisements on front page, Competitions, Contracts, Sales by Auction, &c. may be obtained on application to the Publisher.

SITUATIONS WANTED.

FOUR Lines (about THIRTY words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.

REPLIES TO ADVERTISEMENTS,

Addressed Box ——, Office of "The Builder,"

Cannot be forwarded, but must in all cases be called for, and the Office Receipt produced.

THE CHARGE FOR A BOX IS AS UNDER:—

For "Situations Wanted" Advertisements ..... 3d. per Week.
For all other Advertisements ..... 6d. per Week.

PREPAYMENT IS ABSOLUTELY NECESSARY.

*** Stamps must not be sent, but all small sums should be remitted by Cash in Registered Letter or by Money Order, payable at the Post-office, King-street, Covent-garden, W.C. to

DOUGLAS FOURDRINIER, Publisher,
Addressed to No. 46, Catherine-street, W.C.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied *direct* from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum, prepaid. Remittances payable as above.

TO CORRESPONDENTS.

W. H. P. (the charge of 5 *per cent.* includes the specification, except in the case of small works).—M. B. (Wolverhampton).—G. M.—J. W. S.—Buyer for thirty years.—D. B.—H. & L.—T. & Son.—S. & A.—R. C.—W. M.—E. D.—F. P.—G. J.—W. H. K.—T. B.—H.—G. B. T.—G. T. H.—A. W.—G. & W.—E. A. L.—G. F. D.—A. J. I.—G. W. F.—T. O.—C. & B.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles and papers read at public meetings, rests, of course, with the authors.

Bath Stone of Best Quality.
RANDELL, SAUNDERS, & CO. (Limited),
Quarrymen and Stone Merchants.
List of Prices at the Quarries and Depôts; also cost of transit to any part of the Kingdom, on application to
Bath Stone Office, Corsham, Wilts. [Advt.]

Bath Freestone in Blocks of all sizes, warranted sound, and delivered at any Port or Railway Station.—YOCKNEY & COMPANY, Sole Owners of the CORSHAM DOWN QUARRY, Corsham, Wilts, to whom all letters should be addressed. [ADVT.]

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to CHARLES TRASK, Norton-sub-Hamdon, Ilminster, Somerset. Agent: E. Crickmay, 4, Agar-street, London, W.C.—[ADVT.]

Asphalte.
Seyssel, Patent Metallic Lava, and White Asphaltes.
M. STODART & CO.
Office:
No. 90, Cannon-street, E.C. [ADVT.]

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 38, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. [ADVT.]

Whitland Abbey Green Slates.—These slates are of a grey green tint, are stout, and made in all sizes. A large stock available for immediate delivery.—For further particulars, apply to MANAGER, Clynderwen, R.S.O., Carmarthenshire. [ADVT.]

J. Sessions & Sons, Docks, Gloucester, Manufacturers of ENAMELLED SLATE and MARBLE CHIMNEY-PIECES, URINALS, &c. WELSH ROOFING SLATES direct from Quarries to any Station in the Kingdom. Manufacturers of Joinery & Mouldings. [ADVT.]

To Sewer Contractors. — POLING BOARDS FOR SALE, 22 ft. poles, short deal-ends, lathwood, and fire-wood. Lowest possible prices, including cartage to works, or all metropolitan goods stations. — GEORGE JEWETT, Plough Bridge, Commercial Docks, S.E.—[ADVT.]

MICHELMORE & REAP,
Manufacturers of
CHARLES COLLINGE'S PATENT
COLLINGE'S PATENT HINGES, LEVER, SCREW, & BARREL BOLTS,
Self-Acting "FALL DOWN" GATE STOPS,
and IMPROVED GATE FITTINGS of every Description.
36A, BOROUGH ROAD, LONDON, S.E.
Discount to Builders.
Illustrated List two stamps.

CHAPPUIS' PATENTS
FOR
REFLECTING LIGHT.—DAYLIGHT REFLECTORS
OF EVERY DESCRIPTION, ALSO
ARTIFICIAL LIGHT REFLECTORS.
P. E. CHAPPUIS, Patentee. Factory, 69, Fleet-st. London, E.C.
N.B.—DIAGRAMS AND PROSPECTUSES ON APPLICATION.